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Topic Break Down

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QUESTION NO: 1

A computer programmer is making $25,000 per year. 28% of her salary is withheld for federal and state deductions.

How much is the computer programmer's net pay?

A. $20,000

B. $7,000

C. $18,750

D. $18,000

ANSWER: D

Explanation:

The correct net pay is **$18,000**. Net pay is the amount remaining from gross salary after deductions are withheld. First calculate the withheld amount: 28% of $25,000 is found by converting 28% to its decimal form, 0.28, and multiplying: $25,000 × 0.28 = $7,000. This is the total amount withheld for the stated federal and state deductions. Then subtract the withholding from the annual gross salary: $25,000 − $7,000 = $18,000. Equivalently, because 28% is withheld, the programmer keeps 72% of her salary. Multiplying $25,000 by 0.72 also gives $18,000. This calculation treats the stated 28% as the full set of deductions specified in the question and expresses the result as annual net pay, since the original salary is stated per year. The U.S. Department of Labor describes net pay as the amount paid after deductions from gross pay; its wage information is available through the Department of Labor wage resources. For a general explanation of calculating percentage amounts, see Khan Academy's percentage review.

QUESTION NO: 2

Car restorers often seek NOS parts.

What does NOS stand for?

A. Near Original Specifications.

B. NASCAR Operating Standards.

C. New Old Stock.

D. None of the above.

ANSWER: C

Explanation:

"New Old Stock." is correct. In automotive restoration, NOS describes genuine original-manufacturer or period replacement parts that were produced years ago, placed into inventory, and never installed or used. These parts are especially valued because they typically retain the original fit, materials, dimensions, and appearance intended for the vehicle when it was new. For a restorer seeking authenticity, an unused period-correct component can be preferable to a modern reproduction part, even when the reproduction is functional. The term is also used more broadly by collectors of vintage equipment, but its automotive meaning remains the same: the part is old inventory, yet new in the sense that it has not been put into service. Hemmings, a major automotive-collector publication, discusses NOS parts in its restoration and collector-car resources: https://www.hemmings.com/stories/. The Antique Automobile Club of America also provides restoration-oriented resources and terminology in the context of preserving historically authentic vehicles: https://aaca.org/.

QUESTION NO: 3

If two pounds of salmon cost $13.98, what is the cost of five ounces of the same brand of salmon?

A. $0.44

B. $0.87

C. $140

D. $2.20

E. $2.18

ANSWER: E

Explanation:

The correct cost is **$2.18**. First, convert the two-pound quantity to ounces: two pounds equals 32 ounces because each pound contains 16 ounces. The exact unit price is therefore $13.98 ÷ 32, which equals $0.436875 per ounce. Multiplying that unrounded price by five ounces gives $2.184375. Since prices are expressed in dollars and cents, round the final result to the nearest cent: $2.18.

It is important to retain the full unit-price value during the calculation rather than rounding it to $0.44 before multiplying. Rounding $0.436875 to $0.44 per ounce first produces $2.20, but that is a rounding error introduced before the final step. Standard numerical practice is to carry sufficient precision through intermediate operations and round only the final reported monetary amount. This problem tests proportional reasoning and unit conversion: determine the price per ounce from the given total weight and total cost, then scale that price to the requested five-ounce amount. The customary pound-to-ounce relationship can be verified through NIST unit-conversion guidance; NIST also provides guidance on appropriate numerical rounding in its SI unit-writing checklist.

QUESTION NO: 4

A baker sells a dozen donuts for $3.99.

The cost to make three donuts is $0.45. How much is the total profit on 5-dozen donuts?

A. $17.70

B. $13.20

C. $2.19

D. $10.95

ANSWER: D

Explanation:

$10.95 is the total profit. First, determine the production cost for one dozen donuts. Since a dozen contains 12 donuts and the stated cost covers 3 donuts, four groups of 3 are needed to make one dozen. The cost per dozen is therefore $0.45 × 4 = $1.80. For 5 dozen, the total production cost is $1.80 × 5 = $9.00.

Next, calculate total sales revenue. Each dozen sells for $3.99, so selling 5 dozen produces $3.99 × 5 = $19.95 in revenue. Profit is the amount left after the cost of making the donuts is subtracted from the money received from selling them: $19.95 − $9.00 = $10.95. This follows the standard relationship that profit equals revenue minus cost. Keeping the units consistent—first working in dozens and then multiplying by 5—ensures that both the selling amount and production cost describe the same quantity of donuts. For additional review of multiplying decimals and solving practical arithmetic problems, see OpenStax Prealgebra: Multiply and Divide Decimals and Khan Academy: Multiplying Decimals.

QUESTION NO: 5

Null most nearly means _____.

A. zero

B. dull

C. unskilled

D. rapid

ANSWER: A

Explanation:

“Zero” is correct because *null* means having no value, amount, force, or legal effect. In mathematics and computing, null commonly denotes the absence of a value or a value of zero; in general usage, it can also mean nonexistent or void. The key shared idea is the absence of something measurable or effective, which makes “zero” the closest available meaning. For example, a null result may indicate no measurable effect, and a null quantity has a value of zero. This meaning is reflected in standard dictionary definitions: Merriam-Webster defines *null* as having no legal or binding force and as amounting to nothing, while Cambridge includes “having no value or effect.” In word-knowledge questions, selecting the nearest common meaning is appropriate even when a word has related specialized uses in law, science, or computing. See Merriam-Webster’s definition of null and Cambridge Dictionary’s definition of null.

QUESTION NO: 6

Which gas primarily makes up the Earth’s atmosphere?

A. carbon dioxide

B. oxygen

C. argon

D. nitrogen

ANSWER: D

Explanation:

Nitrogen is correct because it is the most abundant gas in Earth’s atmosphere, making up about 78% of the air by volume. Atmospheric nitrogen occurs mainly as molecular nitrogen (N_2), a stable form consisting of two nitrogen atoms bonded together. Although nitrogen is essential to life because it is a key component of proteins and nucleic acids, most organisms cannot use atmospheric N_2 directly. Instead, nitrogen must first be converted into biologically useful compounds through processes such as nitrogen fixation.

The atmosphere’s large nitrogen content also has important physical effects. It contributes most of the atmosphere’s mass and pressure and acts as a relatively unreactive background gas that dilutes oxygen. This composition helps support conditions suitable for combustion, respiration, weather, and life without the atmosphere being dominated by highly reactive oxygen. Measurements and standard atmospheric-composition references consistently identify nitrogen as the principal atmospheric constituent. The U.S. National Weather Service lists dry air as approximately 78% nitrogen, and NASA similarly describes nitrogen as the dominant gas in Earth’s atmosphere. See the National Weather Service overview of the atmosphere and NASA’s Earth atmosphere resource.

QUESTION NO: 7

Illusion most nearly means _____.

A. mirage

B. distant

C. sight

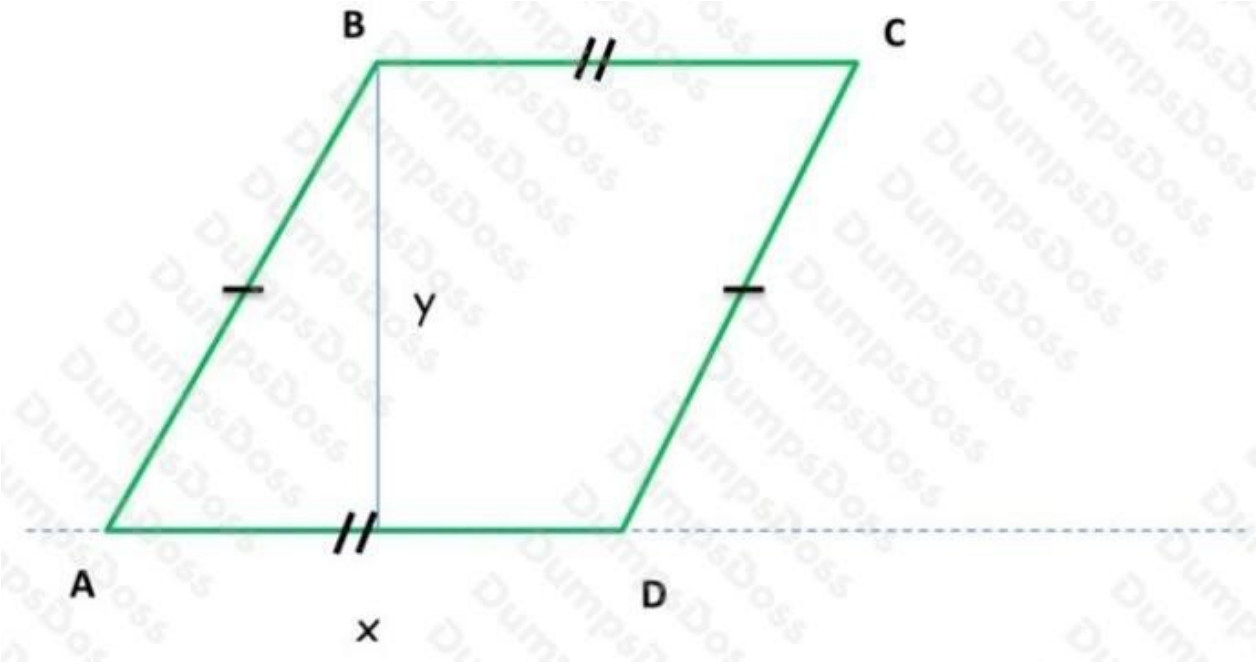
D. perspective

ANSWER: A

Explanation:

"Mirage" is correct because it names something that appears to be real but is actually deceptive or unreal, which closely matches the meaning of "illusion." An illusion is a false perception or mistaken impression: a person may see, hear, or believe something that does not accurately represent reality. A mirage is a familiar specific example of this idea, such as the apparent appearance of water on a hot road or in a desert caused by the bending of light. In word-knowledge questions, the best answer is the choice with the closest meaning, not merely one that is loosely related to seeing. Dictionary definitions support this connection: Merriam-Webster defines an illusion as a misleading image or impression, while it defines a mirage as an optical illusion. See Merriam-Webster's definition of "illusion" and its definition of "mirage". Therefore, "mirage" most nearly means "illusion" in this context.

QUESTION NO: 8



Given the diagram provided, what is the area of parallelogram ABCD if the height y is 7 and the base x is 5?

A. 12

B. 16807

C. 35

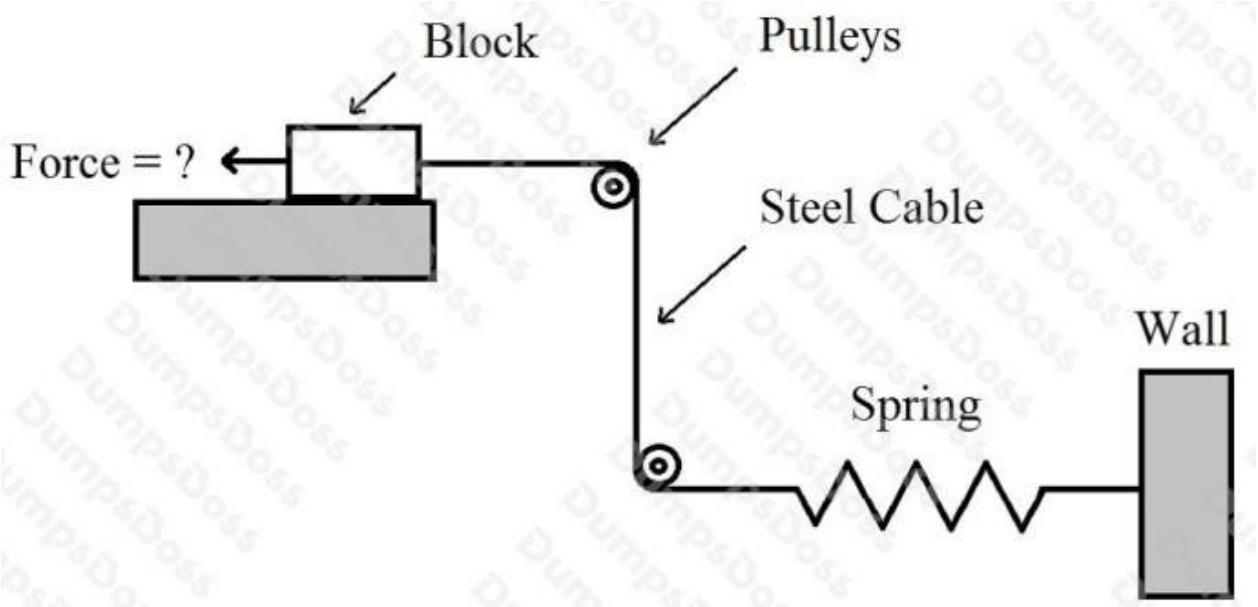
D. 74

ANSWER: C

Explanation:

The area of parallelogram ABCD is **35**. A parallelogram's area is found by multiplying the length of its base by its perpendicular height: *Area = base × height*. Here, the base is identified as x = 5 and the perpendicular height is identified as y = 7. Substituting these values gives 5 × 7 = 35 square units. The height must be measured at a right angle to the chosen base; it is not necessary to use the length of a slanted side when calculating area. Therefore, the parallelogram covers 35 square units. This is the standard geometric area relationship for all parallelograms, including rectangles, rhombi, and slanted parallelograms. For a review of the formula and its geometric meaning, see Math is Fun: Parallelogram and Khan Academy: Area of parallelograms.

QUESTION NO: 9



In the diagram shown above, the spring is very stiff and can be stretched 1 inch by a pulling force of 100 pounds.

How much force must be applied to the block in order to move the box 3.5 inches to the left?

A. 150 pounds

B. 250 pounds

C. 350 pounds

D. 450 pounds

ANSWER: C

Explanation:

350 pounds is correct. The spring's stated behavior gives its spring rate: a 100-pound pulling force produces a 1-inch stretch, so the spring requires 100 pounds of force for each inch of displacement. For an ideal spring operating within its elastic range, the applied force is proportional to the distance the spring is stretched or compressed, as described by Hooke's law, F = kx. Here, the displacement is 3.5 inches and the spring rate is 100 pounds per inch. Multiplying the distance by the force required per inch gives 3.5 × 100 = 350 pounds. Therefore, an applied force of 350 pounds is required to move the box 3.5 inches to the left, assuming the diagram's intended idealized conditions and no additional resisting effects such as friction. This proportional spring-force relationship is the standard mechanical-comprehension principle used for this type of calculation. See OpenStax: Hooke's Law and Encyclopaedia Britannica: Hooke's law.

QUESTION NO: 10

In Wiltshire, England, there is a fascinating site. Near Salisbury stands a creation called Stonehenge. No one is sure of the meaning of the monument that has stood there since ancient times. Some people theorize that it was a temple for people who worshiped the sun. Others have dubbed it a center for healing, a burial site, or even a very large calendar. Many questions remain, such as how in the world the tremendous stones were moved and arranged by primitive people who had only the most basic of tools. In spite of all these questions, Stonehenge remains an impressive site.

Which of these titles would best summarize the point of the above passage?

A. "An Unforgettable Mystery"

B. "Stonehenge in England"

C. "Visiting Wiltshire, England"

D. "Visiting Stonehenge"

ANSWER: A

Explanation:

“An Unforgettable Mystery” is the best title because the passage focuses on the unanswered questions surrounding Stonehenge. Its central idea is not simply that Stonehenge is located in England or that it is a place to visit; rather, it emphasizes how much remains unknown about the monument. The passage presents several possible purposes, including a sun-worship temple, a healing center, a burial site, and a calendar, without confirming any one explanation. It also highlights the continuing puzzle of how ancient people transported and arranged the enormous stones using basic tools. These details create a sense of wonder and uncertainty, which is captured directly by the word “Mystery.” The word “Unforgettable” also fits the concluding idea that Stonehenge remains impressive despite the lack of definite answers. English Heritage describes Stonehenge as a prehistoric monument whose construction and meaning continue to be studied, while UNESCO recognizes it as an exceptional surviving prehistoric landscape. See English Heritage’s Stonehenge history and UNESCO’s Stonehenge World Heritage listing.

QUESTION NO: 11

Alice leaves her house, driving east at 45 miles per hour (mph). Thirty minutes later, her husband Dave notices she forgot her cell phone and sets off after her.

How fast must Dave travel in order to catch up with Alice 3 hours after he leaves?

A. 49 mph

B. 50.5 mph

C. 52.5 mph

D. 54 mph

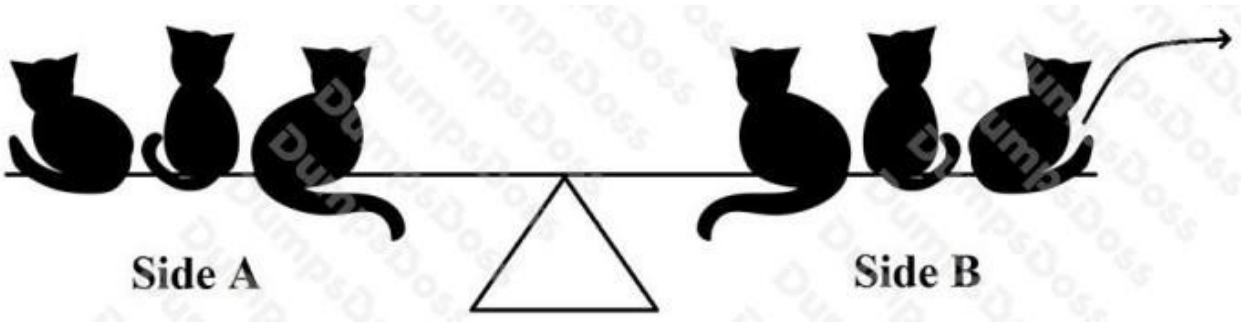
ANSWER: C

Explanation:

52.5 mph is correct. Dave starts 30 minutes, or 0.5 hour, after Alice. During that head-start period, Alice travels 45 miles per hour × 0.5 hour = 22.5 miles. Once Dave leaves, Alice continues driving for the same 3 hours that Dave is on the road. In those 3 hours, Alice travels an additional 45 × 3 = 135 miles. Therefore, when Dave catches her, Alice is 22.5 + 135 = 157.5 miles from the house.

Dave must cover those same 157.5 miles within 3 hours. Using the rate formula, rate = distance ÷ time, Dave’s required speed is 157.5 ÷ 3 = 52.5 miles per hour. This result also makes sense because Dave must travel faster than Alice’s 45 mph in order to eliminate the 22.5-mile lead she established before he departed. For a review of distance, rate, and time relationships, see Khan Academy’s distance-rate-time word problems and OpenStax’s uniform-motion applications.

QUESTION NO: 12



If a cat is removed from Side B of the seesaw, what happens to the cats on Side A?

A. The cat will never move from Side B until it’s good and ready.

B. The cats on Side A will move up in the air.

C. The cats on Side A will move toward the ground.

D. Nothing will happen.

ANSWER: C

Explanation:

The cats on Side A will move toward the ground. A seesaw rotates about its central support, or pivot. Its motion depends on torque: the turning effect produced by weight acting at a distance from that pivot. Before the cat is removed, the weights on both sides create opposing turning effects. Removing a cat from Side B decreases the downward weight and therefore decreases the turning effect on that side. The remaining weight on Side A then has the greater turning effect, causing that end of the seesaw to rotate downward. As Side A descends, the cats sitting there move closer to the ground.

This result follows the basic principle that an unbalanced torque makes an object rotate in the direction of the greater torque. The amount of turning effect depends both on the force caused by gravity and on how far that force is from the pivot. Seesaws are a familiar example of a lever, specifically a lever with the pivot positioned between the loads. For an overview of torque and rotational equilibrium, see OpenStax Physics: Newton's Second Law for Rotation and NASA Glenn Research Center: Torque.

QUESTION NO: 13

Organisms that eat other organisms are called _____.

A. prey

B. plants

C. predators

D. insects

ANSWER: C

Explanation:

"predators" is correct because a predator is an organism that obtains food by hunting, killing, or consuming another organism. The organism being hunted or eaten is called the prey. Predation is an important feeding relationship in ecosystems because it transfers energy through food chains and food webs. Predators include animals such as wolves that hunt deer, spiders that capture insects, and birds that eat fish. The term can also apply more broadly to organisms that consume other organisms, although the exact feeding behavior may differ among species. In basic ecology vocabulary, the predator–prey relationship specifically identifies the eater as the predator and the organism eaten as the prey. Understanding this distinction helps identify organisms' roles in an ecosystem and describe how populations and available resources can influence one another. The National Geographic Society defines predation as a biological interaction in which one organism, the predator, kills and eats another organism, its prey. See National Geographic's overview of predation. For additional ecology terminology and examples of feeding relationships, see Encyclopaedia Britannica's predation reference.

QUESTION NO: 14

The Tao-te-ching (The Way and Its Power) is the basic text of Taoism, a Chinese religion and philosophy. The Tao-te-ching is composed of 81 short chapters or poems that describe a way of life marked by quiet effortlessness and freedom from desire. Taoism teaches that this can be achieved by following the creative, spontaneous life force of the universe, called the Tao. The book is attributed to Lao-tzu, but it was probably written in the third century B.C.

The Tao-te-ching _____.

A. is the basic text of Chinese poetry

B. describes a life way marked by quiet freedom

C. is made up of 81 chapters and a short poem

D. was probably not written by Lao-tzu, even though it is attributed to him

ANSWER: D

Explanation:

“was probably not written by Lao-tzu, even though it is attributed to him” is supported directly by the passage. The key wording is that the work is “attributed to Lao-tzu,” followed by the contrasting statement that it was “probably written in the third century B.C.” Attribution means that a work has traditionally been credited to a person; it does not establish that the person actually authored it. The contrast signaled by “but” invites the reader to distinguish the traditional claim of authorship from the passage’s historical qualification.

This conclusion also fits standard historical descriptions of the text. Lao-tzu is the traditional figure associated with the Tao-te-ching, while modern scholarship generally treats its composition as uncertain and commonly dates the received text to a later period than the era traditionally associated with Lao-tzu. Thus, the answer accurately captures both ideas in the passage: the book bears Lao-tzu’s traditional attribution, yet its likely date of composition makes his personal authorship doubtful. For background, see the Encyclopaedia Britannica discussion of Daoist philosophy and the Stanford Encyclopedia of Philosophy entry on Laozi.

QUESTION NO: 15

The movement of particles from an area of high concentration to an area of lower concentration is called _____.

A. metabolic action

B. diffusion

C. photosynthesis

D. catalysis

ANSWER: B

Explanation:

Diffusion is the net movement of particles from a region where they are more concentrated to a region where they are less concentrated. This movement occurs because particles are in constant random motion. When a concentration difference exists, more particles tend to move away from the crowded region than move back into it, producing a net spread until the concentrations become evenly distributed, or reach equilibrium. Diffusion does not require cellular energy because it is a passive process. It is important in many biological situations, including the movement of oxygen from the air sacs of the lungs into the blood and the movement of dissolved substances across short distances in cells and tissues. The definition in the question directly describes diffusion. For additional background, see OpenStax’s discussion of passive transport and diffusion: https://openstax.org/books/biology-2e/pages/5-1-passive-transport. A concise scientific definition is also available from Encyclopaedia Britannica: https://www.britannica.com/science/diffusion.

QUESTION NO: 16

Jonathan was unusually taciturn this morning.

A. untalkative

B. diplomatic

C. overly detailed

D. able to be touched or felt

ANSWER: A

Explanation:

"Untalkative" is correct because *taciturn* describes a person who is habitually, or in a particular situation, quiet and not inclined to speak much. In the sentence, saying that Jonathan was "unusually taciturn this morning" means that he was quieter and less communicative than normal during that time. The word is most often used to characterize someone's manner of speaking rather than simply indicating that they made no sound at all; it conveys a reserved, reticent, or sparing use of words. The sentence provides a straightforward context clue through "unusually," which signals a temporary contrast with Jonathan's typical behavior: this morning, he was notably less talkative. Major dictionaries define *taciturn* in essentially this way. Merriam-Webster describes it as "temperamentally disinclined to talk," while Cambridge Dictionary defines it as "tending to speak very little." These definitions support "untalkative" as the closest meaning in the provided choices. See Merriam-Webster's definition of taciturn and Cambridge Dictionary's definition of taciturn.

QUESTION NO: 17

The sight was fantastic.

A. simple

B. illusory

C. typical

D. strange

ANSWER: D

Explanation:

In this sentence, "fantastic" is used to describe a sight that was extraordinary, remarkable, or outside the ordinary. "Strange" is the best available match because it conveys the sense of something unusual or astonishing. The word "fantastic" originally relates to fantasy and can describe something remote from normal experience, bizarre, or strikingly unusual; that meaning fits a memorable sight that seems almost unreal. In vocabulary questions, the surrounding sentence is important: "The sight was fantastic" does not merely identify an everyday view, but emphasizes that the view made a strong impression because of its unusual character. Major dictionaries include "strange," "unusual," and "extraordinary" among meanings associated with "fantastic." See the Merriam-Webster definition of fantastic and the Dictionary.com entry for fantastic. Therefore, "strange" is the closest synonym supplied for the intended meaning in this item.

QUESTION NO: 18

Solve for x: = −x2 – x + 30 = 0

A. 4, −8

B. −6, 5

C. −4, 5

D. 6, −3

ANSWER: B

Explanation:

The solution set **−6, 5** is correct. Interpreting the displayed equation as $-x^2 - x + 30 = 0$, first multiply every term by −1. This preserves equality and gives the equivalent equation $x^2 + x - 30 = 0$. To factor this trinomial, find two integers whose product is −30 and whose sum is 1. The numbers 6 and −5 meet those conditions, so the expression factors as $(x + 6)(x - 5) = 0$.

By the zero-product property, a product of two factors can equal zero only when at least one factor equals zero. Setting $x + 6$ equal to zero gives $x = -6$, and setting $x - 5$ equal to zero gives $x = 5$. Substitution confirms both values: each makes the original quadratic expression equal zero. This is the standard factoring method for solving a quadratic equation when its terms can be expressed as a product of binomials. For additional guidance on factoring quadratics and using the zero-product property, see Khan Academy's factoring quadratics lesson and OpenStax Elementary Algebra: Solve Quadratic Equations by Factoring.

QUESTION NO: 19

After a series of well-publicized failures by various inventors, Orville and Wilbur Wright succeeded in flying and controlling a heavier than-air craft on December 17, 1903. The War Department, stung by its investment in a failed effort by Samuel Langley and compounded by the Wright's own secretiveness, initially rejected the brothers' overtures toward the government to buy the aircraft.

Prevailing sentiments held that the immediate future still belonged to the balloon. In August 1908, the two brothers delivered the first Army aircraft to the U.S. Government. That the U.S. government managed to purchase an airplane was a minor miracle. For more than four years after the Wright brothers' successful flight at Kitty Hawk, North Carolina, the government refused to accept the fact that man had flown in a heavier than air machine.

Which of the following statements is not supported by the above passage?

A. The U.S. Government felt that balloons were more practical than airplanes.

B. The Wright Brother's own secretiveness contributed to their problems in getting the government interested in their aircraft.

C. The historic flight took place on the East Coast.

D. It took more than six years for the Wright Brothers to interest the U.S. Government in their airplane.

ANSWER: D

Explanation:

"It took more than six years for the Wright Brothers to interest the U.S. Government in their airplane." is not supported by the passage because the dates stated establish a substantially shorter interval. The brothers' successful controlled, powered flight occurred on December 17, 1903, and the passage says they delivered the first Army aircraft to the U.S. Government in August 1908. That span is about four years and eight months, not more than six years. The passage reinforces this timeline directly by saying that, for "more than four years" after the Kitty Hawk flight, the government would not accept that a heavier-than-air machine had flown. Thus, the text supports a delay of a little under five years before the government obtained an aircraft, while the claim of a delay exceeding six years goes beyond the facts provided. The historical date of the Wrights' first successful flight is also documented by the National Park Service, and the 1908 Army contract and demonstrations are covered by the Library of Congress.

QUESTION NO: 20

A carpenter needs to cut four sections, each 3-feet 8-inches long, from a piece of molding.

If the board is only sold by the foot, what's the shortest length of board she can buy?

A. 15 feet

B. 14 feet

C. 16 feet

D. 12 feet

ANSWER: A

Explanation:

The correct answer is **15 feet**. First, express the required length of each molding section in a single unit. Three feet is 36 inches because each foot contains 12 inches; adding the additional 8 inches gives 44 inches per section. Since the carpenter needs four equal sections, multiply 44 inches by 4: the total required length is 176 inches.

To convert that total back to feet, divide by 12 inches per foot. This gives 14 feet 8 inches (or 14⅔ feet). Because the molding is sold only in whole-foot lengths, the carpenter cannot purchase exactly 14⅔ feet. She must buy the next whole-foot length that is at least as long as the required total: 15 feet. This provides enough material to cut all four 3-foot-8-inch sections, with 4 inches remaining. The calculation assumes no additional allowance is required for saw-kerf material lost during cutting, as is standard unless the question specifically states otherwise. For customary-unit conversion guidance, see NIST's unit conversion resources and Khan Academy's units and measurement review.

QUESTION NO: 21

On modern automobile engines, what's the purpose of the intake manifold?

A. regulate air flow to the cooling system

B. provide air flow to the air conditioner and heater

C. connect the air/fuel management device to the head

D. regulate fuel pump pressure

ANSWER: C

Explanation:

The intake manifold's purpose is to connect the air/fuel management device to the cylinder head and distribute the incoming charge to the engine's intake ports. In a modern port-fuel-injected engine, the manifold receives air from the throttle body or intake plenum; fuel is introduced by injectors near the intake ports. In many direct-injection engines, the manifold carries and distributes air only, while fuel is injected directly into each combustion chamber. In either design, the manifold forms the controlled passage between the intake system and the cylinder head, helping each cylinder receive the air needed for efficient combustion. Its runners are often designed with specific lengths and shapes to support airflow and torque across different engine speeds. Some engines also use variable intake-manifold systems to alter airflow paths as operating conditions change. This makes "connect the air/fuel management device to the head" the best description, because it identifies the manifold's central physical and airflow-distribution role. For further technical background, see AA1Car's intake-manifold overview and Encyclopaedia Britannica's internal-combustion-engine reference.

QUESTION NO: 22

A three-digit code must be used to access a computer file. The first digit must be an A or a

B. The second digit must be a number between 0 and 9. The final digit is a single letter from the alphabet from A to Z.

How many possible access codes can there be?

A. 38

B. 468

C. 520

D. 640

ANSWER: C

Explanation:

The correct answer is **520**. Apply the multiplication principle: when a code is formed through sequential choices, multiply the number of available choices for each position. The first position has 2 possible characters, because it may be A or B. The

second position has 10 possible digits: 0 through 9, inclusive. The final position has 26 possible letters, from A through Z. Therefore, the number of distinct codes is 2 × 10 × 26, which equals 520.

This calculation assumes that each position is selected independently and that repetition is permitted when relevant. In this case, the letter in the final position is independently chosen from the full alphabet, while the middle position is independently chosen from all ten decimal digits. This is a standard application of the fundamental counting principle, which states that if one task can be performed in m ways and a subsequent independent task can be performed in n ways, the combined process can be performed in m × n ways. See OpenStax: The Fundamental Counting Principle and Khan Academy: Fundamental Counting Principle.

QUESTION NO: 23

What is the latitude of any point on earth's equator?

A. 0

B. 90

C. 180

D. 270

ANSWER: A

Explanation:

The correct answer is **0**. Latitude measures how far a location lies north or south of the Equator, expressed in degrees. The Equator is the reference line from which all latitude is measured, so every point located directly on it has a latitude of 0°. Locations in the Northern Hemisphere have latitudes from just above 0° up to 90° north at the North Pole, while locations in the Southern Hemisphere range from just below 0° to 90° south at the South Pole. Because the Equator circles Earth midway between the poles, its latitude remains 0° everywhere along its length. This is distinct from longitude, which measures positions east or west of the Prime Meridian and changes continuously around the Equator. The U.S. National Oceanic and Atmospheric Administration describes latitude as the angular distance north or south of the Equator, and the National Geographic Society identifies the Equator as the imaginary line at 0° latitude. See NOAA Ocean Service: Latitude and Longitude and National Geographic: Equator.

QUESTION NO: 24

An ammeter measures _____.

A. Resistance

B. Current

C. Voltage

D. Capacitance

ANSWER: B

Explanation:

An ammeter measures **current**, the rate at which electric charge flows through a circuit. Electric current is measured in amperes (A), commonly called amps, which is the origin of the instrument's name. To measure the current in a particular branch or component, an ammeter is connected in series so that the same charge flow passing through the circuit also passes through the meter. An ideal ammeter has very low internal resistance, minimizing its effect on the current being measured. In practical electronics, a multimeter set to its current-measurement mode functions as an ammeter; its leads must be placed in the appropriate current input jack and the meter inserted into the circuit path. This distinction is fundamental for the ASVAB Electronics Information area: current describes charge flow, while other electrical quantities require different measuring instruments or meter settings. The National Institute of Standards and Technology defines the

ampere as the SI base unit associated with electric current. See NIST's definition of the ampere and All About Circuits' overview of ammeter design and use.

QUESTION NO: 25

Solve for x: x2 = 3x + 10.

A. x = 3; x = 10

B. x = −3; x = −10

C. x = −2; x = 5

D. x = 2; x = −5

ANSWER: C

Explanation:

The correct solution is **x = −2; x = 5**. Interpreting "x2" as x squared, first place the equation in standard quadratic form by subtracting 3x and 10 from both sides: $x^2 - 3x - 10 = 0$. This trinomial factors as $(x - 5)(x + 2)$ because multiplying the factors produces $x^2 - 3x - 10$. The zero-product property states that when a product of factors equals zero, at least one factor must equal zero. Setting $x - 5$ equal to zero gives $x = 5$, and setting $x + 2$ equal to zero gives $x = -2$. Both values can be verified directly in the original equation: 5^2 equals $3(5) + 10$, and $(-2)^2$ equals $3(-2) + 10$. Thus, each value satisfies the equation, so the complete solution set contains −2 and 5. For a review of factoring quadratic expressions and solving factored equations, see Math is Fun: Factoring Quadratics and OpenStax: Solve Quadratic Equations by Factoring.

QUESTION NO: 26

An axe is an example of what type of simple machine.

A. Lever

B. Inclined plane

C. Wedge

D. None of the above

ANSWER: C

Explanation:

An axe is a **wedge**, a simple machine made of two inclined planes joined back-to-back to form a sharp edge. When force is applied to the axe handle, that force is directed through the thin blade into the material being struck. The wedge shape concentrates the applied force over a very small area and redirects it outward, producing forces that push the wood apart. This makes an axe effective for cutting, splitting, and separating materials such as wood.

In practical terms, a sharper, narrower axe blade generally enters material more easily because it concentrates the force over an even smaller contact area. The axe handle helps the user deliver force and control the tool, but the blade's wedge geometry is the feature that performs the simple-machine function of splitting the material. The National Museum of American History describes wedges as simple machines used to split or cut objects, while OpenStax explains that wedges are formed from inclined planes and transform an input force into outward forces. See Smithsonian: Wedges and OpenStax Physics: Simple Machines.

QUESTION NO: 27

An audience consists of M people, and 2/3 of the audience are adults. C the adults, 1/2 are males.

How many adult males are in the audience?

A. 1/6 M

B. M − 2/3 − 1/2

C. 1/3 M

D. M − 1/3

ANSWER: C

Explanation:

The number of adult males is **1/3 M**. Start with the total audience, M. Since two-thirds of the audience are adults, the number of adults is (2/3)M. The question then states that one-half of those adults are male. “Of” indicates multiplication, so multiply the adult total by 1/2: (1/2) × (2/3)M. Multiplying the fractions gives 2/6, which simplifies to 1/3. Therefore, the audience contains (1/3)M adult males. This approach—finding a fractional part of a total and then a fractional part of that result—is a standard fraction-of-a-quantity procedure used in ASVAB arithmetic reasoning. For a review of multiplying fractions, see Khan Academy’s multiplying fractions lesson. The same calculation can be checked with a convenient total such as 6M units: two-thirds would be 4M adults, and half of 4M is 2M, which is one-third of 6M. For further fraction-operation guidance, see OpenStax Prealgebra: Multiply and Divide Fractions.

QUESTION NO: 28

1.5 volts sent through a 20KΩ resistor would result in _____ of current.

A. 7.5 milliamperes

B. 0.075 milliamperes

C. 75 milliamperes

D. 0.000075 milliamperes

ANSWER: B

Explanation:

0.075 milliamperes is correct according to Ohm’s law, which states that current equals voltage divided by resistance: $I = V/R$. Here, the applied voltage is 1.5 volts and the resistance is 20 KΩ. The prefix “kilo” means one thousand, so 20 KΩ equals 20,000 Ω. Substituting the values gives I = 1.5 V ÷ 20,000 Ω = 0.000075 amperes. Because one ampere equals 1,000 milliamperes, multiplying 0.000075 amperes by 1,000 converts the result to 0.075 milliamperes. This is also 75 microamperes, since one milliampere equals 1,000 microamperes. Using consistent base units—volts for voltage and ohms for resistance—ensures that the calculated current is initially expressed in amperes. The result can then be converted to a more convenient smaller unit such as milliamperes. For a discussion of Ohm’s law and the relationship among voltage, current, and resistance, see OpenStax College Physics. SI prefix values, including kilo and milli, are listed by NIST.

QUESTION NO: 29

In the diagram in question 4, if the wheel on the left turns clockwise, which way will the wheel on the right turn?

A. Clockwise

B. Counterclockwise

C. Counter-counterclockwise

D. Unable to tell from the information given

ANSWER: B

Explanation:

Counterclockwise is correct because the referenced diagram shows the left and right wheels transmitting motion through direct contact/meshing. At the point where the two wheels meet, their surfaces must move in the same linear direction; otherwise, the wheels would attempt to slide through one another. A clockwise-turning left wheel has a particular tangential surface motion at its contact point. To match that motion at the corresponding contact point on the right wheel, the right wheel must rotate counterclockwise. This reversal of rotational direction occurs for each pair of directly contacting gears or friction wheels. The wheel diameter may change the relative speed of rotation, but it does not change this direction relationship: one directly driven wheel turns opposite the wheel driving it. This principle is fundamental to gear trains and other rotary-motion systems. For a concise overview of how meshed gears rotate in opposite directions, see Encyclopaedia Britannica: gear. The same tangential-contact principle is also described in NASA Glenn Research Center's gear explanation.

QUESTION NO: 30

The distance between cities A and B is approximately 1,800 miles.

If you drive an average of 55 miles per hour, how many hours will it take you to drive from city A to city B?

A. approximately 22 hours

B. approximately 24 hours

C. approximately 36 hours

D. approximately 33 hours

ANSWER: D

Explanation:

The correct answer is **approximately 33 hours**. Travel time is found by dividing the total distance by the average speed: time = distance ÷ speed. Here, 1,800 miles ÷ 55 miles per hour equals approximately 32.73 hours. Because the question asks for an approximate number of hours and the available response is stated in whole hours, 32.73 rounds to 33 hours.

It is important that the units support the calculation: dividing miles by miles per hour cancels miles and leaves hours. The phrase "average of 55 miles per hour" means that 55 mph should be used as the overall rate for the entire 1,800-mile trip, rather than treating it as a speed for only one portion of the drive. This is a standard distance-rate-time relationship commonly tested in arithmetic reasoning. For a review of solving rate problems using the formula distance = rate × time, see Khan Academy's rate-problem introduction. A further explanation of the relationship among distance, speed, and time is available from OpenStax College Physics.

QUESTION NO: 31

The word nullify most nearly means _____.

A. confine

B. void

C. ratify

D. free

ANSWER: B

Explanation:

"Void" is correct because to *nullify* something is to make it legally or practically ineffective; in other words, to cancel it, invalidate it, or render it without force. The term is especially common in legal and formal contexts. For example, a court may nullify a contract if it was formed through fraud, meaning the agreement is treated as having no legal effect. Similarly, a rule, decision, or vote can be nullified when an authorized action cancels its validity. Major dictionaries define *nullify* using closely related terms such as "make legally null and void" and "cause to have no force or effect." This direct overlap makes "void" the closest meaning in the question. Understanding these precise synonym relationships is useful on the ASVAB Word Knowledge subtest, where the best answer is the one that most closely matches the tested word's central meaning and usual usage. See the definitions from Merriam-Webster and Cambridge Dictionary.

QUESTION NO: 32

According to Newton's first law of motion, an object in motion tends to _____.

A. stop eventually

B. decelerate quickly

C. stay in motion

D. move forever

ANSWER: C

Explanation:

Newton's first law states that an object already in motion will continue moving with constant velocity—meaning at the same speed and in the same direction—unless acted upon by a net external force. Therefore, "stay in motion" correctly completes the statement. This principle is also called the law of inertia: matter resists changes to its current state of motion. In everyday situations, moving objects often slow down because forces such as friction with a surface or air resistance act on them. Those forces are external forces, so the slowing is consistent with Newton's law rather than an exception to it. In the idealized case where no net force acts, a moving object does not require a continuing push to keep moving; it continues in a straight line at constant speed. Newton's first law provides the baseline for analyzing motion and identifying when forces are changing an object's velocity. See NASA Glenn Research Center's overview of Newton's laws and OpenStax Physics: Newton's First Law of Motion and Inertia.

QUESTION NO: 33

The doctor gave the patient a cursory examination.

A. in-depth

B. painful

C. unnecessary

D. superficial

ANSWER: D

Explanation:

"Superficial" is correct because *cursory* describes something done quickly and without careful attention to every detail. In this sentence, a cursory examination is a brief, general examination rather than one that is extensive or thorough. The word often suggests that a person has looked at or considered something only on the surface, with limited investigation. This meaning fits naturally in a medical context: the doctor performed an initial or quick assessment instead of a detailed evaluation. Major dictionaries define *cursory* as hasty, rapidly and often superficially performed, or giving only a brief and general view. See the definitions from Merriam-Webster and Cambridge Dictionary. Recognizing this synonym is useful for Word Knowledge questions because context may clarify whether a word concerns speed, depth, or completeness. Here, "examination" makes the intended sense especially clear: the examination lacked detailed scrutiny, so "superficial" most precisely conveys the meaning of *cursory*.

QUESTION NO: 34

Negligible most nearly means _____.

A. Weak

B. Significant

C. Trivial

D. Noteworthy

ANSWER: C

Explanation:

“Trivial” is correct because *negligible* describes something so small, slight, or unimportant that it does not need to be considered seriously. For example, a negligible difference in two measurements is a difference too minor to have a meaningful effect on the result. Likewise, a negligible risk is one that is extremely slight in practical terms. “Trivial” carries this same core meaning of little importance or consequence, making it the closest synonym in this context. Recognizing synonym relationships is central to Word Knowledge questions: focus on the word’s ordinary meaning as it is used in context rather than on a possible association with the word. Merriam-Webster defines *negligible* as “so small or unimportant or of so little consequence as to warrant little or no attention,” which directly aligns with “trivial.” See the definitions at Merriam-Webster: negligible and Cambridge Dictionary: trivial.

QUESTION NO: 35

Which material is best suited for use as a boat anchor?

A. foam

B. metal

C. wood

D. glass

ANSWER: B

Explanation:

Metal is best suited for use as a boat anchor because it is generally dense, strong, and durable. An anchor must have enough weight to sink through the water and help resist forces from wind, waves, and currents that could move the boat. Common marine anchors are therefore made from metals such as steel, iron, aluminum alloys, or stainless steel, with the particular metal and anchor design selected according to the vessel and intended conditions. Beyond providing weight, metal can be formed into effective anchor shapes, including flukes and shanks, that dig into or hold onto the seabed. It also has the mechanical strength needed to withstand repeated loading from the anchor rode and the boat. Marine-grade metals may be galvanized, painted, or otherwise protected to limit corrosion in saltwater environments. The U.S. Coast Guard emphasizes that vessels should carry a suitable anchor and sufficient anchor line for the boating environment, while boating-safety guidance describes anchors as equipment designed to hold a vessel in place. See the U.S. Coast Guard Boating Safety Equipment guidance and the BoatUS anchoring guide.

QUESTION NO: 36

Perseverance most nearly means _____.

A. popular

B. happy

C. persistent

D. modest

ANSWER: C

Explanation:

“Persistent” is correct because perseverance is the quality of continuing to work toward a goal despite difficulty, delay, or setbacks. A person who shows perseverance does not give up easily; they remain steady and determined in their efforts. In word-knowledge questions, the best answer is the one that matches the central meaning of the tested word rather than merely being associated with a positive personality trait. Major dictionaries define perseverance as continued effort to do or achieve something despite obstacles or discouragement, which directly corresponds to being persistent. See the Merriam-Webster definition of perseverance and the Cambridge Dictionary definition. Therefore, “persistent” is the closest synonym and accurately completes the sentence.

QUESTION NO: 37

If doughnuts are usually 75 cents each, but there is a sale on Friday advertising them as 1 dozen + 1/2 dozen for $10.80, what is the new cost for just one?

A. 55 cents

B. 50 cents

C. 60 cents

D. 65 cents

ANSWER: C

Explanation:

60 cents is correct because the advertised quantity must first be converted into an individual number of doughnuts. One dozen equals 12 doughnuts, and one-half dozen equals 6 doughnuts. Together, the sale includes 18 doughnuts. The unit price is found by dividing the total sale price by the total number of doughnuts: $10.80 ÷ 18 = $0.60 per doughnut. Expressed in cents, $0.60 is 60 cents.

This is a unit-rate calculation: identify the total quantity in the package, then divide the total cost by that quantity. The usual price of 75 cents provides context for the sale but is not needed to compute the new per-item price. Working with dollars is especially convenient here because 10.80 divided by 18 gives an exact decimal amount of 0.60. For practice with unit rates and division in word problems, see Khan Academy’s introduction to rates and Math Is Fun’s unit-price guide.

QUESTION NO: 38

During Friday night's high school performance of the play Seven Brides for Seven Brothers, 76% of the seats in the performing arts center (with a seating capacity of 500 people) were occupied, and three-quarters of those attending were parents.

How many high school students attended the play?

A. 95

B. 100

C. 76

D. 285

ANSWER: A

Explanation:

The correct answer is **95**. First, calculate the total number of people attending. The performing arts center has 500 seats, and 76% were occupied: 500 × 0.76 = 380 attendees. Three-quarters of the attendees were parents, so the remaining one-quarter were high school students. One-quarter of 380 is 380 ÷ 4 = 95. Therefore, 95 high school students attended the performance.

This is a two-step percentage problem: determine the occupied-seat total first, then apply the fraction representing students to that attendance total. Equivalently, students represent 25% of attendees, so 380 × 0.25 = 95. The result is a whole number of people, which is appropriate for the situation. For review of converting percentages to decimals and calculating a percentage of a quantity, see Khan Academy's percentage review. For practice with fractions, including the relationship between three-quarters and one-quarter, see Math Is Fun: Fractions.

QUESTION NO: 39

Using functional magnetic resonance imaging (fMRI), researchers have identified abnormalities in the brains of children with attention deficit/hyperactivity disorder (ADHD) that may serve as a biomarker for the disorder, according to a study presented November 28 at the annual meeting of the Radiological Society of North America (RSNA). ADHD is one of the most common childhood disorders, affecting an estimated five to eight percent of school-aged children. Symptoms, which may continue into adulthood, include inattention, hyperactivity and impulsivity behaviors that are out of the normal range for a child's age and development. What is the best title for this passage?

A. "ADHD Occurrence in Children is Between 5% and 8%"

B. "MRIs Aid in Earlier ADHD Diagnosis"

C. "Brain Differences Found in Children with ADHD"

D. "ADHD Kids Exhibit Abnormal Behavior"

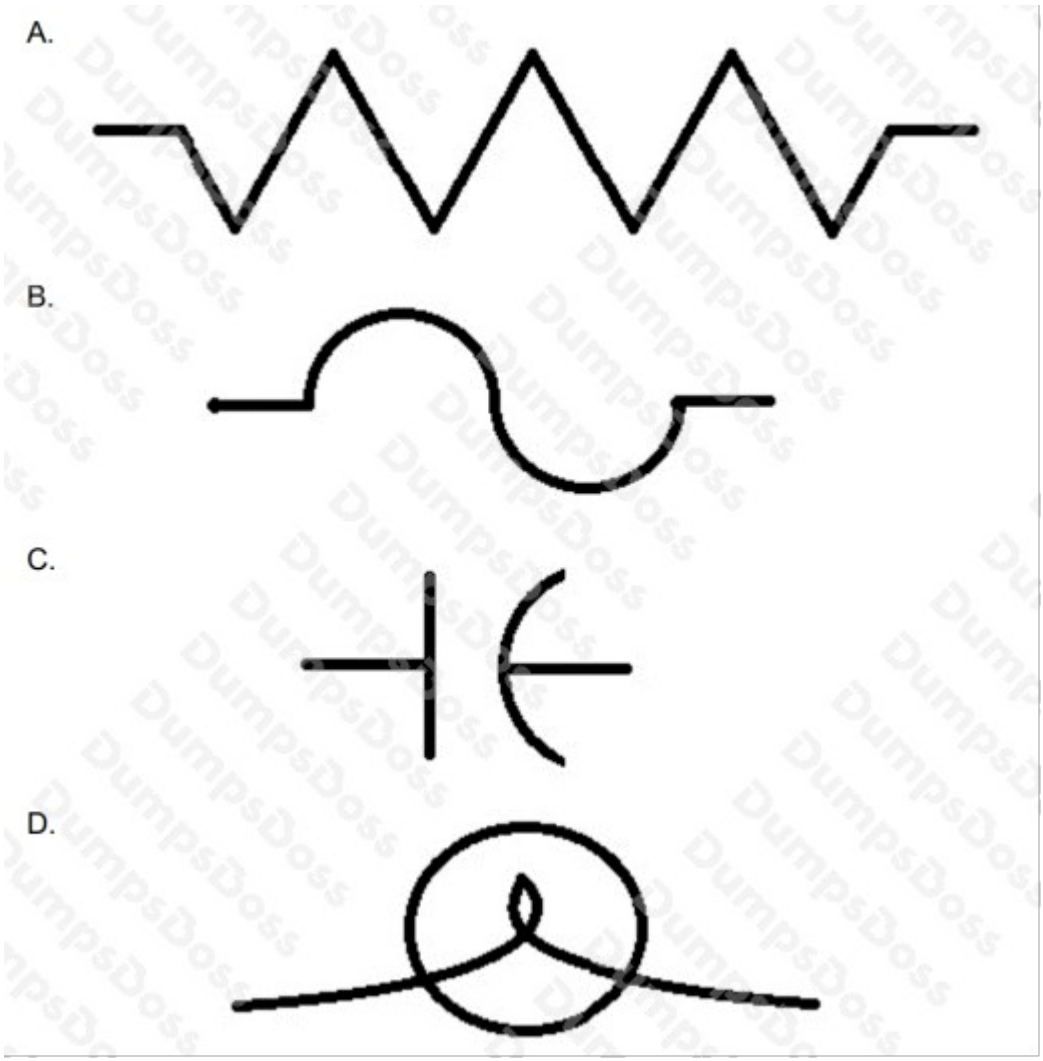
ANSWER: C

Explanation:

"Brain Differences Found in Children with ADHD" is the best title because it captures the passage's central finding: researchers used functional magnetic resonance imaging to identify brain abnormalities in children who have ADHD. The passage is primarily reporting on an imaging study and its potential significance, namely that the observed differences may eventually serve as a biomarker for the disorder. A strong title should state the broad main idea rather than focus on one supporting detail, such as the estimated prevalence of ADHD or the list of symptoms. This title is also appropriately cautious: it says that differences were found, without claiming that fMRI already provides a definitive or earlier diagnosis. That matches the wording of the passage, which describes the findings as a possible biomarker rather than an established diagnostic test. ADHD is a neurodevelopmental disorder characterized by patterns of inattention and/or hyperactivity-impulsivity that affect functioning; brain-imaging research can help scientists investigate underlying mechanisms. For background on ADHD, see the National Institute of Mental Health's ADHD overview. For information about the organization where the study was presented, see the Radiological Society of North America.

QUESTION NO: 40

Which of these is a symbol for a fuse?



A. Option A

B. Option B

C. Option C

D. Option D

ANSWER: B

Explanation:

A fuse is an overcurrent-protection device placed in series with a circuit so that all current for the protected branch passes through it. In schematic diagrams, it is represented by a dedicated inline symbol rather than by the symbols used for components such as resistors, capacitors, or lamps. The depicted inline fuse symbol identifies the protective component intended to open the circuit when excessive current heats and melts its internal fusible element. Once the element opens, current can no longer flow through that branch, helping limit damage to wiring and other electrical equipment.

Recognizing the fuse symbol is important on wiring diagrams because it shows where circuit protection is located and where a loss of continuity may occur after an overcurrent condition. Standardized graphical symbols make diagrams readable across technical manuals and electrical systems, although the exact fuse artwork can vary slightly between IEC and ANSI-style drawings. The selected symbol is the one conventionally used to indicate a fuse in the group shown. For further examples of common electrical schematic symbols, see Electronics Tutorials: Circuit Symbols and All About Circuits: Schematic Symbols.

QUESTION NO: 41

Weal most nearly means _____.

A. happiness

B. injury

C. scream

D. tire

ANSWER: A

Explanation:

Happiness is correct because *weal* is a noun meaning a state of well-being, welfare, prosperity, or happiness. In vocabulary questions, the best answer is the choice that most closely captures the word's central meaning in ordinary modern English. Although *weal* is less common today and often appears in formal, historical, or civic expressions, it refers to a person's or community's good condition and flourishing. For example, "the common weal" means the common welfare or public good. Because happiness is a state of personal well-being and contentment, it is the closest available synonym. The term may also carry a broader sense of prosperity or welfare rather than merely a momentary pleasant emotion, but "happiness" accurately represents its favorable, well-being-related meaning for this question. Merriam-Webster defines *weal* as "well-being" and "prosperity," while Dictionary.com includes "a state of being happy, prosperous, or well." These definitions support happiness as the most nearly equivalent answer. See Merriam-Webster's definition of weal and Dictionary.com's definition of weal.

QUESTION NO: 42

The process of water molecules escaping the Earth's surface and entering the atmosphere is known as _____.

A. Condensation

B. Precipitation

C. Evaporation

D. Collection

ANSWER: C

Explanation:

Evaporation is the process in which liquid water at Earth's surface gains enough energy to change into water vapor, a gas, and enter the atmosphere. Energy from sunlight is a major driver of this phase change, although evaporation can occur whenever surface water molecules have sufficient kinetic energy to escape from the liquid. It occurs from oceans, lakes, rivers, wet soil, and other exposed water surfaces. Water vapor produced through evaporation is an essential part of the water cycle because it transports water from the surface into the atmosphere, where it may later cool, condense into clouds, and eventually return to the surface. The wording "water molecules escaping the Earth's surface and entering the atmosphere" directly describes this liquid-to-gas transition. The U.S. Geological Survey describes evaporation as the process by which water changes from a liquid to a gas or vapor, and NASA identifies evaporation as a key movement of water from Earth's surface to the atmosphere. See the USGS Water Science School and NASA's water-cycle overview.

QUESTION NO: 43

Scrupulous most nearly means _____.

A. Unorganized

B. Tolerable

C. Easy going

D. Thorough

ANSWER: D

Explanation:

“Thorough” is correct because *scrupulous* describes a person who pays very close attention to details and is careful to do things correctly. A scrupulous worker checks work carefully, follows procedures conscientiously, and avoids overlooking even small details. The word can also carry an ethical sense: someone who is scrupulous is very careful to act honestly and fairly. In either use, the central idea is painstaking care and precision, making “thorough” the closest available meaning.

This is a useful word-knowledge relationship for the ASVAB: identify the core meaning rather than looking for an exact word-for-word substitute. Here, the clue is the emphasis on careful, complete attention to what must be done. Merriam-Webster defines *scrupulous* as “having moral integrity” and “exact, painstaking,” while Dictionary.com includes “having or showing a strict regard for what one considers right; principled” and “punctilious; painstaking.” Those definitions support the close connection between being scrupulous and being thorough in one’s work or conduct. See Merriam-Webster: scrupulous and Dictionary.com: scrupulous.

QUESTION NO: 44

If a car’s ignition system, lights, and radio don’t work, the part that’s probably malfunctioned is the _____.

A. cylinder block

B. water pump

C. carburetor

D. battery

ANSWER: D

Explanation:

The battery is the most likely malfunctioning part because it supplies electrical energy to the vehicle’s starting/ignition circuits and to electrical accessories such as the lights and radio, particularly when the engine is not running. If these otherwise separate systems all fail at the same time, the shared power source or its primary connection is the logical place to check first. A discharged, failed, or poorly connected battery can leave the ignition system without the electrical power needed to operate while also preventing lights and the radio from functioning. In practical diagnosis, technicians would also inspect battery terminals and cables for corrosion or looseness, since those conditions can interrupt the battery’s ability to deliver power. The battery remains the component identified by the symptoms because it is the central stored-energy source for these vehicle electrical loads. The U.S. Department of Energy describes the conventional vehicle battery as providing electricity to start the vehicle and power accessories, and the National Institute for Automotive Service Excellence outlines battery and starting-system fundamentals in its automotive service resources. See U.S. Department of Energy: How Gasoline Cars Work and ASE Test Series.

QUESTION NO: 45

There are three beams that are each 10 feet long and all of the same size. One is made of wood, another of steel, and the third of concrete.

If identical loads are applied to these three beams, which of the following will occur?

A. The steel beam will deflect less than the wood beam.

B. The wood beam will deflect less than the concrete beam.

C. The wood beam will deflect less than the steel beam.

D. The concrete beam will deflect more than the other two.

ANSWER: A

Explanation:

The steel beam will deflect less than the wood beam. For beams with the same length and cross-sectional dimensions subjected to identical loading and support conditions, elastic deflection depends primarily on the material's modulus of elasticity, commonly called stiffness. A material with a higher modulus resists elastic deformation more strongly, so the beam bends less under the same load. Structural steel has a much higher modulus of elasticity than wood; typical design values for steel are about 29,000,000 pounds per square inch, while wood values are substantially lower and vary with species, grain direction, moisture content, and grade. Therefore, assuming the beams remain within their elastic ranges, the steel beam will have less deflection than the wood beam. This conclusion follows directly from standard beam-deflection relationships, in which deflection is inversely proportional to the material stiffness when geometry and loading are held constant. The U.S. Forest Service's Wood Handbook discusses wood's elastic properties and their variability. The American Institute of Steel Construction provides the standard elastic modulus used for structural steel in its Steel Construction Manual.

QUESTION NO: 46

Vigilant most nearly means _____.

A. Nonchalant

B. Observant

C. Virtuous

D. Strenuous

ANSWER: B

Explanation:

"Observant" is correct because *vigilant* describes being watchful, alert, and attentive to possible danger, changes, or important details. A vigilant person actively notices what is happening around them and remains prepared to respond if needed. For example, a vigilant sentry carefully watches an area for anything unusual, while a vigilant driver stays alert to road conditions and other vehicles. This meaning closely matches "observant," which refers to being quick to notice or pay close attention to things. Major dictionaries define *vigilant* in terms of watchfulness and alert attention: Merriam-Webster defines it as "alertly watchful especially to avoid danger," and Cambridge Dictionary describes it as being "careful to notice problems or signs of danger." In an ASVAB Word Knowledge question, the goal is to select the choice with the closest meaning rather than one that merely has a positive tone or describes effort. The shared idea between "vigilant" and "observant" is attentive awareness of one's surroundings or circumstances. See Merriam-Webster's definition of vigilant and the Cambridge Dictionary entry for vigilant.

QUESTION NO: 47

A security guard walks the equivalent of six city blocks when he makes a circuit around the building.

If he walks at a pace of eight city blocks every 30 minutes, how long will it take him to complete a circuit around the building, assuming he doesn't run into any thieves?

A. 20.00 minutes

B. 3.75 minutes

C. 22.50 minutes

D. 24.00 minutes

ANSWER: C

Explanation:

The correct answer is **22.50 minutes**. The guard's walking rate is eight city blocks in 30 minutes. To find the time needed for one block, divide the total time by the number of blocks: 30 ÷ 8 = 3.75 minutes per block. A complete circuit is equivalent to six blocks, so multiply the time per block by six: 3.75 × 6 = 22.5 minutes. Therefore, the guard will complete one circuit in 22.50 minutes, which is also 22 minutes and 30 seconds. This applies the fundamental rate relationship: time equals distance divided by rate. Equivalently, the guard travels 8/30 block per minute, and 6 ÷ (8/30) also equals 22.5 minutes. For additional practice with rate, time, and distance calculations, see Khan Academy's rate-problem introduction and OpenStax Prealgebra: Ratios and Rates.

QUESTION NO: 48

Napoleon often showed his audacity in battle.

A. alacrity

B. clemency

C. boldness

D. timidity

ANSWER: C

Explanation:

"Boldness" is correct because *audacity* means a willingness to take daring, confident, or courageous action, particularly when that action involves risk. In the sentence, saying that Napoleon showed audacity in battle means that he acted boldly in military situations. The wording suggests fearless initiative and a readiness to make difficult or dangerous decisions, which is the central meaning conveyed by "boldness." Major dictionaries define *audacity* in closely related terms, including "boldness or daring" and a willingness to take risks. In historical descriptions of commanders, this word often characterizes a leader who acts decisively and confidently under pressure. Thus, replacing *audacity* with "boldness" preserves both the sentence's meaning and its positive description of Napoleon's conduct in battle. See the Merriam-Webster definition of audacity and the Cambridge Dictionary definition of audacity.

QUESTION NO: 49

If a rectangle has a perimeter of 36 feet, and it's 4-feet wide, what's its area?

A. 56 square feet

B. 128 square feet

C. 112 square feet

D. 16 square feet

ANSWER: A

Explanation:

The correct answer is **56 square feet**. A rectangle's perimeter is found by adding all four sides, which can be written as P = 2(length + width). With a perimeter of 36 feet and a width of 4 feet, substitute the known values: 36 = 2(length + 4). Divide both sides by 2 to obtain 18 = length + 4. Subtract 4, so the rectangle's length is 14 feet. Area measures the amount of two-dimensional space inside a shape and is calculated for a rectangle by multiplying its length by its width: area = length × width. Therefore, the area is 14 feet × 4 feet, which equals 56 square feet. The unit must be square feet because the calculation multiplies one linear measurement in feet by another measurement in feet. This uses the standard rectangle formulas described by Khan Academy's area of rectangles review and the definition of perimeter provided by Encyclopaedia Britannica.

QUESTION NO: 50

What special type of diode is commonly used to regulate voltage?

A. capacitor

B. transistor

C. Zener diode

D. LED

ANSWER: C

Explanation:

A Zener diode is commonly used for voltage regulation because it is designed to operate safely in its reverse-breakdown region. When reverse-biased voltage reaches the diode's specified Zener voltage, the diode conducts in a controlled manner while maintaining an approximately constant voltage across itself. This characteristic lets a Zener diode serve as a simple voltage reference or shunt regulator, provided that a series resistor or another current-limiting method is used to keep the diode current within its rated operating range.

For example, a circuit using a 5.1-volt Zener diode can help hold an output or reference point near 5.1 volts despite modest changes in supply voltage or load current. Zener diodes are manufactured with many nominal breakdown-voltage ratings, allowing circuit designers to select a diode appropriate for the required regulated voltage. Their regulation behavior makes them a fundamental component in basic power-supply and protection circuits. See All About Circuits: Zener Diodes and Electronics Tutorials: Zener Diode.

QUESTION NO: 51

Max's new cell phone worked great, but every now and then he would hear intermittent static.

A. loud

B. soft

C. periodic

D. vehement

ANSWER: C

Explanation:

The correct answer is **periodic**. In this context, "intermittent" describes static that occurs occasionally rather than continuously. The phrase "every now and then" directly signals that the static starts and stops over time, which is the essential meaning of periodic or recurring at intervals. Although periodic events can sometimes follow a regular schedule, the word is commonly used in vocabulary questions as the closest available synonym for something that happens from time to time. Thus, Max does not hear a constant background noise; he hears static that recurs at separate times.

This usage matches standard dictionary definitions of "intermittent," which describe something that occurs at intervals or is not continuous. See the Merriam-Webster definition of intermittent and the Cambridge Dictionary definition of intermittent. Recognizing contextual clues such as "every now and then" is especially useful in word-knowledge questions because it confirms that the intended meaning concerns an on-and-off pattern of occurrence.

QUESTION NO: 52

Silver is a better conductor than copper. But copper is more often used because of _____.

A. the cost of silver

B. the strength of copper

C. the low melting point of silver

D. the tendency of silver to tarnish

ANSWER: A

Explanation:

The cost of silver is correct. Silver has the highest electrical conductivity of all metals, meaning that, under comparable conditions, it allows electric current to flow with less resistance than copper. Nevertheless, copper is used far more often for electrical wiring, motors, circuit components, and power-distribution equipment because it delivers excellent conductivity at a vastly lower material cost. This makes copper the practical choice when large quantities of conductor are needed. Copper is also readily available and can be drawn into wire and formed into useful electrical components, but the key reason identified by the question is the economic difference: using silver in most ordinary electrical applications would be unnecessarily expensive relative to the modest performance gain. The U.S. Geological Survey identifies silver as the most electrically conductive metal, while standard engineering references describe copper as a leading electrical conductor used widely in wiring and equipment because of its favorable combination of conductivity and cost. See the U.S. Geological Survey's silver information and Encyclopaedia Britannica's overview of copper.

QUESTION NO: 53

Your piggy bank contains $19.75 in dimes and quarters. There are 100 coins in all.

How many dimes are there?

A. 25

B. 30

C. 35

D. 40

ANSWER: C

Explanation:

The correct answer is **35**. Let the number of dimes be *d*. Because there are 100 coins altogether, the number of quarters is *100 − d*. The value of the dimes, in cents, is 10d, and the value of the quarters is 25(100 − d). Since the total value is $19.75, or 1,975 cents, the value equation is 10d + 25(100 − d) = 1,975. Expanding and simplifying gives 10d + 2,500 − 25d = 1,975, so −15d = −525. Dividing both sides by −15 gives d = 35. Therefore, the piggy bank contains 35 dimes. As a quick check, the remaining 65 coins are quarters: 35 dimes are worth $3.50 and 65 quarters are worth $16.25. Together they equal $19.75, confirming the result. This is a standard two-variable coin-value problem: use the total number of coins and the total monetary value to form equations. For related algebraic modeling guidance, see Khan Academy's linear-equations resources and the official ASVAB applicant information.

QUESTION NO: 54

2.5 × 33 = _____.

A. 22.5

B. 75.0

C. 67.5

D. 675.0

E. 82.5

ANSWER: E

Explanation:

The correct result is **82.5**. One reliable way to calculate the product is to split 33 into 30 and 3. Multiplying 2.5 by 30 gives 75, and multiplying 2.5 by 3 gives 7.5. Adding these partial products gives 75 + 7.5 = 82.5. This uses the distributive property of multiplication: 2.5 × (30 + 3) = (2.5 × 30) + (2.5 × 3). The decimal can also be checked by treating 2.5 as 25 tenths. Then 25 × 33 = 825, and because 2.5 contains one digit after the decimal point, placing the decimal one position from the right produces 82.5. Therefore, the original marked answer of 67.5 is not the product of 2.5 and 33; a new answer choice is needed. For additional instruction on multiplying decimals, see Khan Academy's multiplying-decimals lesson. A direct numerical verification is also available through Wolfram|Alpha.

QUESTION NO: 55

The sergeant gave his reasoned opinion.

A. irate

B. logical

C. impressive

D. uninformed

ANSWER: B

Explanation:

"Logical" is correct because *reasoned* describes an opinion formed through rational thought, sound judgment, and consideration of facts or evidence. In the sentence, saying that the sergeant gave his "reasoned opinion" indicates that his view was not impulsive or arbitrary; it was based on an orderly process of thinking. *Logical* is therefore the closest synonym because it means characterized by valid, sensible reasoning. This is a word-knowledge relationship: the task is to identify the choice that most nearly preserves the meaning of the tested word in its specific sentence context. The surrounding noun, "opinion," supports this interpretation, since an opinion can be described as reasoned when it reflects careful analysis and a coherent rationale. Merriam-Webster defines *logical* as agreeing with the rules of logic and as being sensible or reasonable, which directly matches the intended meaning here. Cambridge Dictionary likewise defines *reasoned* as based on clear thought and reason. See Merriam-Webster: logical and Cambridge Dictionary: reasoned.

QUESTION NO: 56

What are chloroplasts?

A. Structures found in plant cells that assist in photo synthesis.

B. Organelles found in plant cells that conduct photosynthesis.

C. Substances found in primitive cyanobacteria.

D. Substances found in green plants only after they blossom.

ANSWER: B

Explanation:

"Organelles found in plant cells that conduct photosynthesis." is correct because chloroplasts are specialized cell structures, or organelles, where photosynthesis takes place. They are present in plants and algae and contain chlorophyll, the green pigment that captures energy from sunlight. That captured light energy drives reactions that convert water and carbon dioxide into glucose, a chemical form of stored energy; oxygen is released as a product. Chloroplasts also have internal membrane structures called thylakoids, which contain the pigment and protein systems needed for the light-dependent stages of photosynthesis. Their presence enables plant cells to make much of their own food rather than obtaining energy

solely by consuming other organisms. This function is fundamental to plant growth and to many food chains, since the organic molecules made through photosynthesis can be used by the plant and subsequently by organisms that eat plants. For a concise overview of chloroplast structure and function, see Encyclopaedia Britannica's chloroplast article and the OpenStax Biology overview of photosynthesis.

QUESTION NO: 57

Pretense most nearly means _____.

A. polite

B. dishonesty

C. stress

D. appearance

ANSWER: B

Explanation:

dishonesty is the best answer because a pretense is an attempt to make something false appear true, or to present a feeling, reason, ability, or situation that is not genuine. For example, someone may act under the pretense of helping another person while actually pursuing a hidden personal motive. In that use, the word involves deception or a lack of honesty about one's real intentions, identity, or circumstances.

Dictionary definitions consistently connect *pretense* with a false display, claim, or appearance intended to deceive. Merriam-Webster defines it as a "false show" or an unsupported claim, while Britannica describes it as a false reason or appearance used to hide the real purpose. Those meanings make dishonesty the closest available synonym in this vocabulary question. The word can describe either the deceptive act itself or the invented justification used to conceal the truth. See Merriam-Webster's definition of pretense and Britannica Dictionary's definition of pretense.

QUESTION NO: 58

If −7x = 49, then x = _____.

A. 7

B. 0

C. −7

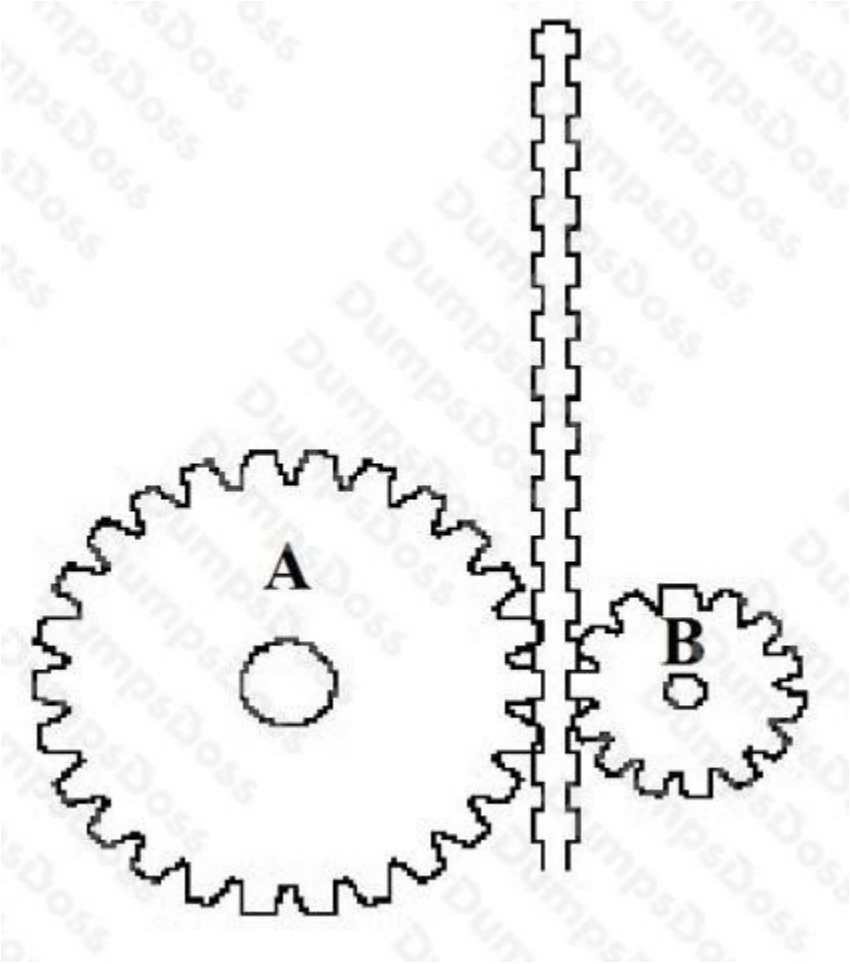
D. 14

ANSWER: C

Explanation:

The correct answer is **−7**. To isolate *x* in the equation −7x = 49, divide both sides by −7. This gives x = 49 ÷ (−7). A positive quantity divided by a negative quantity is negative, and 49 divided by 7 equals 7, so x = −7. The result can be verified by substituting it into the original equation: −7 multiplied by −7 equals positive 49, which matches the right-hand side. This is a standard one-step linear equation: use the inverse operation, division, to undo multiplication by the coefficient attached to the variable. Keeping track of the signs is essential; multiplying or dividing two negative values produces a positive result. For further review of solving linear equations using inverse operations, see Khan Academy's linear-equations resources and OpenStax Elementary Algebra.

QUESTION NO: 59



In the figure above, if the cogs move up the track at the same rate of speed, Cog A will _____.

A. reach the top at the same time as Cog B

B. reach the top after Cog B

C. reach the top before Cog B

D. have greater difficulty staying on track

ANSWER: C

Explanation:

reach the top before Cog B is correct because Cog A has the larger diameter. For a cog rolling along a track, the distance traveled in one complete rotation equals its circumference. Since circumference increases directly with radius, the larger cog advances farther along the track during each rotation than the smaller cog. Thus, when both cogs turn at the same rotational rate, Cog A has the greater linear speed and covers the fixed distance to the top in less time.

This relationship can also be expressed as $v = r\omega$, where linear speed (v) equals the cog's radius (r) multiplied by its angular speed (ω). With equal angular speeds, the cog with the larger radius produces a larger linear speed. Therefore, Cog A moves farther per unit of time and arrives at the top first. This is a fundamental rolling-motion principle: the size of the rolling object affects how much track distance it covers for the same amount of rotation. See OpenStax's discussion of the relationship between angular and linear quantities at Rotational Variables and its rolling-motion overview at Rolling Motion.

QUESTION NO: 60

Ergonomics is the science of designing and arranging workspaces so that people and objects interact efficiently and safely. Lack of attention to ergonomics causes thousands of workers to suffer repetitive stress injury, eye fatigue, muscle soreness, and many other medical problems each year.

Adequate lighting, well-designed chairs, and clutter-free work areas contribute to effective ergonomic design. The opportunity to take short breaks every hour or two, especially for deskbound workers, is also helpful. It's also important for workers to avoid performing the same movements over and over for hours at a time. Variety in the type of work being done can decrease the chance of injury.

According to this passage, it's reasonable to assume that _____.

A. employers should invest in ergonomic design to protect workers

B. lack of ergonomic design isn't dangerous

C. labor unions have opposed ergonomic design

D. poor design is responsible for most employee accidents

ANSWER: A

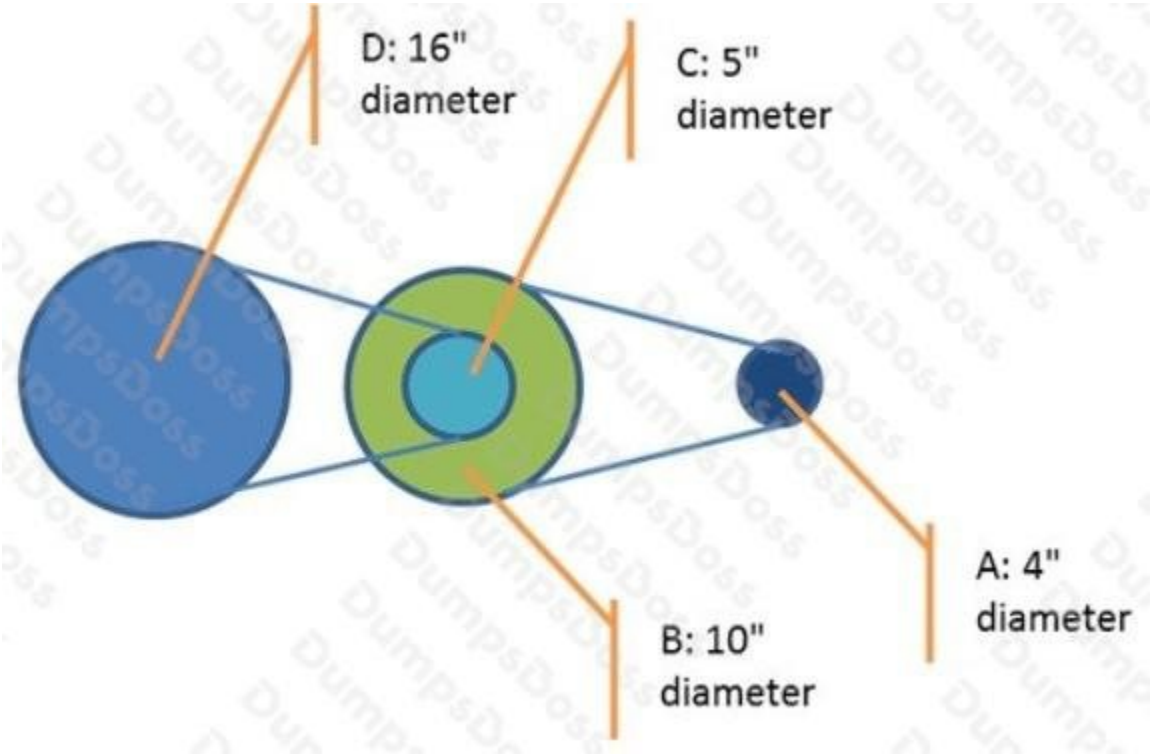
Explanation:

The statement **"employers should invest in ergonomic design to protect workers"** is a reasonable conclusion from the passage. The passage defines ergonomics as arranging workspaces for safe and efficient interaction between people and objects, then directly connects inadequate ergonomic attention with repetitive-stress injuries, eye fatigue, muscle soreness, and other medical problems. It also identifies practical measures—such as adequate lighting, supportive chairs, uncluttered work areas, periodic short breaks, and varying repetitive tasks—that reduce physical strain and the likelihood of injury.

Because employers generally control or provide the work environment, furniture, workspace arrangement, scheduling practices, and work processes, they are in the position to implement these ergonomic measures. Investing in them logically follows from the passage's emphasis on preventing worker harm. This conclusion does not require assuming an exact number of accidents or any position held by outside organizations; it simply applies the stated safety benefits of ergonomics to the party responsible for workplace conditions. The Occupational Safety and Health Administration explains that ergonomics addresses the fit between workers and their jobs and can help prevent work-related musculoskeletal disorders. See OSHA: Ergonomics and NIOSH: About Ergonomics.

QUESTION NO: 61

In the pulley system below, how fast does pulley D rotate, if pulley A rotates at 100 rpm?



A. 25 rpm

B. 50 rpm

C. 100 rpm

D. 12.5 rpm

ANSWER: D

Explanation:

12.5 rpm is correct. For a belt-driven pulley pair with no slipping, the belt's linear speed is the same at both pulley rims. Therefore, rotational speed is inversely proportional to pulley diameter: the driven pulley's speed equals the driver's speed multiplied by the driver diameter divided by the driven diameter.

Pulley A has a diameter of 4 and drives pulley B, which has a diameter of 10. Thus, pulley B rotates at 100 × 4/10 = 40 rpm. Pulleys B and C are fixed to the same shaft, so they must rotate together at the identical shaft speed of 40 rpm. Pulley C, with a diameter of 5, then drives pulley D, with a diameter of 16. Applying the same inverse-diameter relationship gives pulley D's speed as 40 × 5/16 = 12.5 rpm.

This result also follows the expected physical pattern: at each stage, a smaller driving pulley turns a larger driven pulley, reducing the rotational speed. The governing belt-speed relationship is commonly expressed as $N_1D_1 = N_2D_2$, where N is rotational speed and D is pulley diameter. See Engineering ToolBox: Belt Transmissions and OpenStax Physics: Rotational Variables.

QUESTION NO: 62

She was surprised by the terse reply to her question.

The word terse most nearly means _____.

A. lengthy

B. compact

C. gentle

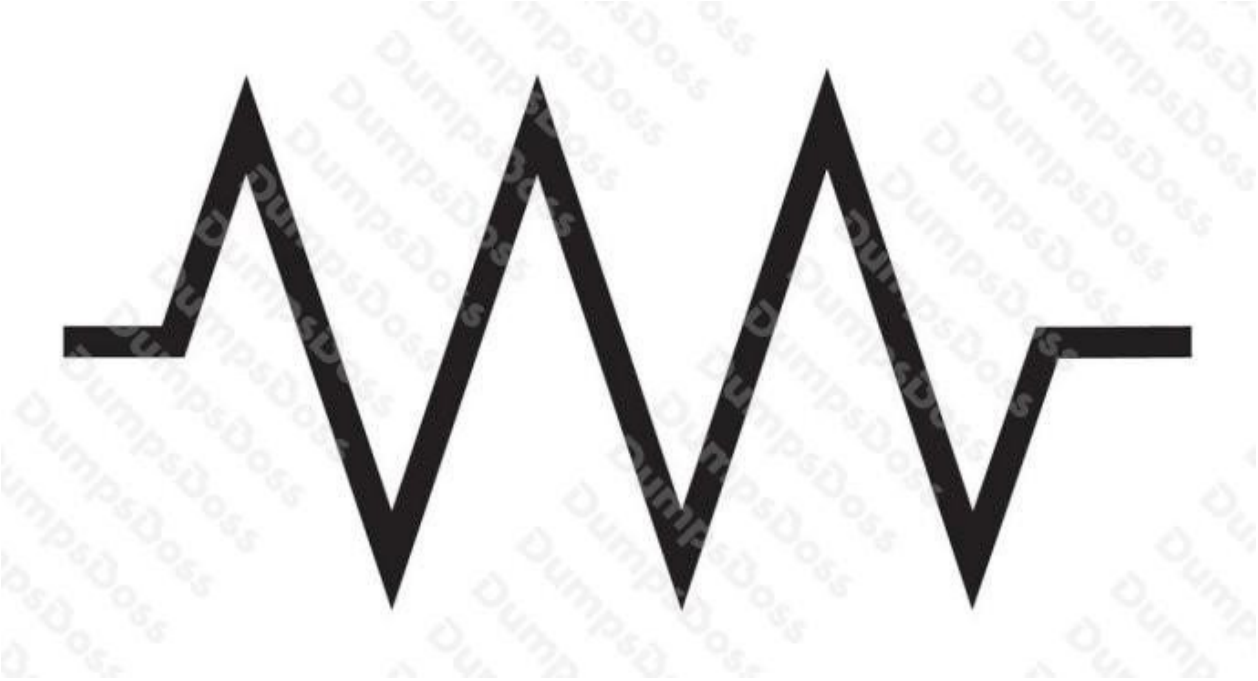
D. abrupt

ANSWER: D

Explanation:

The correct answer is **abrupt**. In this sentence, a "terse reply" is one that is very brief and may sound abrupt, clipped, or somewhat unfriendly. The surrounding context supports this meaning: the woman was surprised by the reply, suggesting that its short, sharp manner was unexpected. "Terse" commonly describes speech or writing that uses few words and can convey impatience, bluntness, or a lack of warmth. For example, someone who responds to a detailed question with "No" has given a terse—and potentially abrupt—reply. Major dictionaries define *terse* as brief and often rude or discourteous in tone. See the Merriam-Webster definition of terse and the Cambridge Dictionary definition of terse. Therefore, "abrupt" is the closest match because it captures both the brevity and the potentially sharp tone implied by "terse" in this context.

QUESTION NO: 63



The symbol above represents a _____.

A. thyristor

B. resistor

C. transistor

D. fuse

ANSWER: B

Explanation:

The symbol represents a resistor. In circuit diagrams, a resistor is shown as a fixed passive component placed in series with a conductor, using either a zigzag line in common North American notation or a rectangular body in IEC notation. Its purpose is to oppose the flow of electric current by providing a specified resistance, measured in ohms. Resistors are fundamental components used to limit current, create voltage drops, set bias conditions, divide voltages, and protect sensitive parts of a circuit from excessive current. The recognition of standard schematic symbols is an important electronics skill because a circuit diagram communicates component functions without requiring a physical picture of each device. The symbol in the image corresponds to the conventional representation for a resistor, so “resistor” is the correct completion of the sentence. For standard schematic-symbol references, see the All About Circuits schematic-symbol guide and the Electronics Tutorials overview of resistors.

QUESTION NO: 64

Which of the following is the mode in this series of numbers?

2, 2, 6, 6, 6, 6, 8, 8, 8, 10, 10, 12

A. 8

B. 10

C. 6

D. 12

ANSWER: C

Explanation:

The correct answer is **6**. The mode of a data set is the value that occurs more often than any other value. To find it, count the occurrences of each number in the series: 2 appears twice, 6 appears four times, 8 appears three times, 10 appears twice, and 12 appears once. Since 6 has the greatest frequency, it is the mode. A set can sometimes have more than one mode when multiple values tie for the greatest frequency, but this series has one clear most-frequent value. Identifying the mode is useful when describing the most common result or observation in a group of data, particularly when the data consist of repeated values. For a definition and examples of the mode as a measure of central tendency, see Encyclopaedia Britannica's overview of mode and the Cuemath explanation of mode.

QUESTION NO: 65

Which of these would be a normal resting heart rate of an adult?

A. 84 beats per minute

B. 50 beats per minute

C. 118 beats per minute

D. 42 beats per minute

ANSWER: A

Explanation:

84 beats per minute is a normal resting heart rate for an adult. For most adults, a resting heart rate between 60 and 100 beats per minute is considered within the usual range. "Resting" means the pulse is measured while the person is calm, seated or lying down, and has not recently exercised, experienced significant stress, or consumed stimulants that could temporarily raise the rate.

Heart rate is controlled by the heart's natural pacemaker and adjusted by the nervous system to supply the body with oxygenated blood. Individual resting rates can vary with age, fitness level, medications, temperature, illness, and emotional state. A value of 84 beats per minute falls comfortably within the standard adult resting range, making it the appropriate answer for a general health-science question. The American Heart Association identifies 60–100 beats per minute as the normal resting range for most adults, and MedlinePlus provides similar clinical guidance on pulse measurement and expected rates. See American Heart Association: Target Heart Rates and MedlinePlus: Pulse.

QUESTION NO: 66

He gave a succinct account of the events.

A. passionate

B. lengthy

C. uncensored

D. concise

ANSWER: D

Explanation:

"Concise" is correct because *succinct* means expressed clearly and briefly, using few words without unnecessary detail. In the sentence, a "succinct account" is a short, direct description of what happened that still communicates the important information. "Concise" has the same essential meaning and fits naturally in the context: "He gave a concise account of the events." Both words describe communication that is economical, focused, and free from excess wording. This is a common vocabulary relationship tested in Word Knowledge questions, where the best answer is the word closest in meaning to the underlined or tested term while preserving the sentence's meaning. Merriam-Webster defines *succinct* as "marked by brevity and clarity," which directly aligns with *concise*. See Merriam-Webster: succinct. Cambridge Dictionary likewise defines

succinct as speaking or writing in a clear way using few words, reinforcing that “concise” is the appropriate synonym in this sentence. See Cambridge Dictionary: succinct.

QUESTION NO: 67

What is the scientific notation for 832,000?

A. 8.32 × 10-2

B. 8.32 × 102

C. 8.32 × 10-5

D. 8.32 × 105

ANSWER: D

Explanation:

The correct scientific notation is **8.32×10^5**. Scientific notation writes a number as a coefficient greater than or equal to 1 and less than 10, multiplied by a power of 10. Starting with 832,000, place the decimal after the first nonzero digit to form 8.32. The decimal point has effectively moved five positions to the left: 832,000 → 8.32. Moving the decimal left when converting a large standard-form number produces a positive exponent, so the multiplier must be 10^5. This can be verified by reversing the process: multiplying 8.32 by 100,000 moves its decimal five positions to the right, giving 832,000. Scientific notation is useful because powers of ten compactly represent the size, or order of magnitude, of very large and very small quantities while retaining their significant digits. For further guidance on expressing numbers with powers of ten, see OpenStax Prealgebra: Exponential Notation and NIST: SI Units and Powers of Ten.

QUESTION NO: 68

In which automotive system would you find a “wishbone”?

A. transmission

B. engine

C. exhaust

D. suspension

ANSWER: D

Explanation:

The correct answer is **suspension**. In automotive terminology, a wishbone is a control arm with two mounting points at the vehicle’s chassis or subframe and one outer connection to the steering knuckle or wheel hub assembly. Its triangular, fork-like shape resembles a wishbone, which gives the part its informal name. Wishbones are central components of independent suspension designs, particularly double-wishbone systems, where upper and lower control arms guide the wheel through its travel.

By locating the wheel and controlling its movement relative to the vehicle body, the wishbone helps maintain intended wheel alignment angles, including camber, as the suspension compresses and rebounds. This supports stable handling, predictable steering response, tire contact with the road, and ride control. The control arm generally connects through bushings at its inner pivots and through a ball joint at the outer end, allowing necessary movement while keeping the wheel properly positioned. For an overview of suspension functions and components, see Encyclopaedia Britannica’s suspension reference and Hagerty’s explanation of control arms.

QUESTION NO: 69

A pot sitting on a hot burner is an example of _____.

A. Convection

B. Conduction

C. Insulation

D. Radiation

ANSWER: B

Explanation:

A pot sitting directly on a hot burner is an example of **conduction**. Conduction is heat transfer through direct physical contact between materials at different temperatures. The burner transfers thermal energy to the bottom of the pot where the two surfaces touch. Energy moves from the hotter burner material into the cooler pot material as particles in the metal vibrate and pass energy to neighboring particles. Once the pot becomes hot, it can in turn conduct heat into the food or water inside it. This is the fundamental heat-transfer process used when cookware contacts an electric coil, solid hot plate, or similar burner surface. The rate of conduction depends on factors including the temperature difference, the area of contact, and the material's thermal conductivity; metals used in cookware conduct heat relatively effectively. The U.S. Department of Energy describes conduction as heat transfer through direct contact, and OpenStax similarly identifies heat flow through solids by molecular interactions as conduction. See U.S. Department of Energy: Heat Transfer and Insulation and OpenStax Physics: Heat Transfer.

QUESTION NO: 70

A family of four have a dinner bill for $44.00. A 15% tip is added after an 8% tax is added to the amount.

How much is the tip?

A. $4.05

B. $6.60

C. $6.71

D. $7.13

ANSWER: D

Explanation:

The correct tip is **$7.13** because the wording specifies that the 15% tip is calculated *after* the 8% tax has been added. First calculate the taxed bill: $44.00 × 1.08 = $47.52. The factor 1.08 represents the original 100% of the dinner bill plus 8% tax. Next, find 15% of the taxed total: $47.52 × 0.15 = $7.128. Money amounts are expressed to the nearest cent, so $7.128 rounds to $7.13. This result is the tip alone, not the final amount paid for dinner. The final total would be found only after adding the $7.13 tip to the $47.52 taxed bill. This problem uses successive percentage calculations: when one percentage is applied after another, calculate the later percentage from the updated amount rather than automatically using the original amount. For a review of converting percentages to decimals and calculating percentages by multiplication, see Khan Academy's percent word problems guide. Guidance on rounding decimal values to a specified place value is available from Math Is Fun.

QUESTION NO: 71

Carpet stain protector costs $0.65 per square yard to apply.

How much will it cost to apply the protectant to a 16-foot × 18-foot carpet?

A. $187.20

B. $62.40

C. $20.80

D. $96.00

ANSWER: C

Explanation:

The correct answer is **$20.80**. First, find the carpet's area in square feet: 16 feet multiplied by 18 feet equals 288 square feet. Because the protectant is priced by square yard rather than by square foot, the area must be converted before applying the price. One yard equals 3 feet in length, so one square yard measures 3 feet by 3 feet, or 9 square feet. Dividing 288 square feet by 9 gives 32 square yards. The application charge is $0.65 for each square yard, so multiply 32 by $0.65: 32 × 0.65 = 20.80. Therefore, applying the carpet stain protector to the entire carpet costs $20.80. This calculation properly accounts for the fact that area conversions are squared: a linear conversion of 3 feet per yard becomes 9 square feet per square yard. The National Institute of Standards and Technology lists the yard as 3 feet in its unit-conversion guidance: NIST—Units of Length. For additional guidance on converting area units, see Khan Academy—Area and units of area.

QUESTION NO: 72

The principal wanted to rebuke the students.

A. Reward

B. Question

C. Ignore

D. Reprimand

ANSWER: D

Explanation:

"Reprimand" is correct because *rebuke* means to express sharp disapproval of someone's conduct, usually through a direct verbal correction or scolding. In the sentence, the principal intends to address the students' behavior with authoritative disapproval, which is precisely what it means to reprimand them. The words are close synonyms and match both the action and tone implied by a school principal responding to student conduct. Major dictionaries define *rebuke* as expressing criticism or disapproval, often sharply, and define it as a verb synonymous with reprimanding. This makes "Reprimand" the best replacement for *rebuke* without changing the sentence's meaning. See the Merriam-Webster definition of "rebuke" and the Cambridge Dictionary entry for "rebuke".

QUESTION NO: 73

The ovaries produce _____.

A. androgen

B. estrogen

C. adrenaline

D. growth hormone

ANSWER: B

Explanation:

The ovaries produce **estrogen**, a group of steroid hormones that plays a central role in the female reproductive system. Estrogen is produced primarily by developing ovarian follicles and, after ovulation, by the corpus luteum. Its levels vary throughout the menstrual cycle, helping regulate follicle development, ovulation-related processes, and preparation of the uterine lining for a possible pregnancy. Estrogen also contributes to the development and maintenance of many female secondary sex characteristics, including breast development and characteristic patterns of fat distribution. Although the ovaries have several reproductive and endocrine functions, estrogen is the hormone most directly associated with ovarian hormone production in this question. The endocrine-system overview from the National Institute of Diabetes and Digestive and Kidney Diseases identifies the ovaries as glands that make estrogen and progesterone. MedlinePlus likewise describes estrogen as a hormone important to female sexual and reproductive development and function. These sources support identifying estrogen as the intended ovarian hormone product. NIDDK: The Endocrine System MedlinePlus: Estrogen

QUESTION NO: 74

A circle measures 12 feet in diameter.

What's its area to the nearest foot?

A. 452

B. 24

C. 113

D. 48

ANSWER: C

Explanation:

The correct answer is **113**. A circle's area is found with the formula $A = \pi r^2$, where r is the radius. The stated 12-foot measurement is the diameter—the full distance across the circle through its center—so the radius is half of that value: 6 feet. Squaring the radius gives 36 square feet. Multiplying by π gives 36π, which is approximately 113.097 square feet. Since the question asks for the area to the nearest square foot, 113.097 rounds to 113 square feet. Area must be expressed in square units because it measures the amount of two-dimensional surface enclosed by the circle. This calculation uses π as approximately 3.14159; using 3.14 also produces 113.04, which rounds to the same whole-number result. The radius-versus-diameter distinction is the key step in applying the circle-area formula accurately. See the circle-area formula and definitions at Math Is Fun: Area of a Circle and Encyclopaedia Britannica: Area.

QUESTION NO: 75

Uncontrolled, rapid drying of wood (for instance, lumber) causes _____.

A. warping

B. harmless discoloration, unless it's green, which indicates rot

C. checking and cracking

D. an increase in wood strength

ANSWER: C

Explanation:

Uncontrolled, rapid drying causes **checking and cracking** because moisture leaves the outer portions of a piece of wood faster than it can move from the wetter interior. As the surface dries, it shrinks. The core remains moist and resists that shrinkage, creating internal stresses. When those stresses exceed the wood's strength perpendicular to the grain, separations develop in the surface or at the ends. These defects are called checks; if they extend deeply or fully through the wood, they are commonly described as cracks or splits.

Proper lumber seasoning controls the drying rate by managing temperature, relative humidity, and air circulation. This lets moisture content equalize more gradually from the interior to the surface, reducing stress and helping preserve the lumber's quality and usability. Wood-drying guidance from the U.S. Forest Service identifies surface checking and end checking as drying defects associated with excessively rapid moisture loss. See the U.S. Forest Service Wood Handbook and the U.S. Forest Service resource on lumber drying.

QUESTION NO: 76

Factor 9x3 + 18x2 – x – 2.

A. (9x2 – 1)(x + 2)

B. (9x2 + 1)(x – 2)

C. (9x2 + 2)(x – 1)

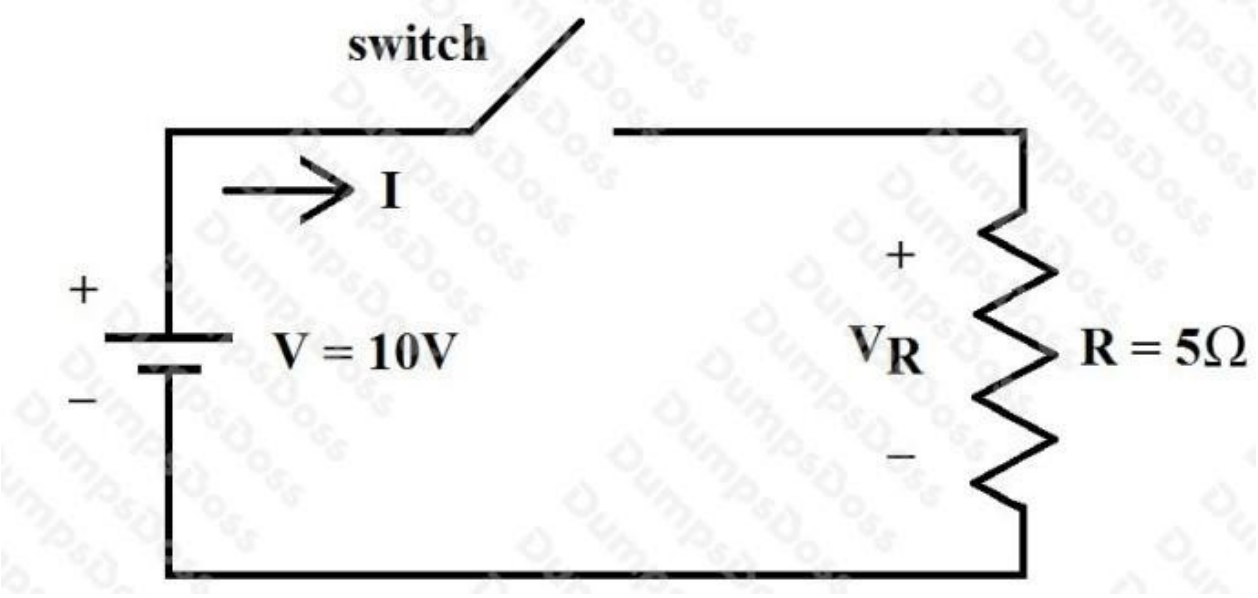
D. (9x2 – 2)(x + 1)

ANSWER: A

Explanation:

The correct factorization is **(9x2 – 1)(x + 2)**. Interpreting the notation in the question conventionally, the expression is $9x^3 + 18x^2 - x - 2$. Factoring by grouping is an efficient method because the four terms can be separated into two pairs: $9x^3 + 18x^2$ and $-x - 2$. The greatest common factor of the first pair is $9x^2$, producing $9x^2(x + 2)$. The greatest common factor of the second pair is -1, producing $-1(x + 2)$. Both grouped expressions now contain the common binomial factor $(x + 2)$, so it can be factored out: $(x + 2)(9x^2 - 1)$, which is equivalently written as (9x2 – 1)(x + 2). Expanding this result confirms it: $9x^2 \cdot x$ gives $9x^3$, $9x^2 \cdot 2$ gives $18x^2$, $-1 \cdot x$ gives $-x$, and $-1 \cdot 2$ gives -2. This is exactly the original polynomial. Factoring by grouping relies on identifying a shared binomial after factoring a greatest common factor from each group; see Math Is Fun: Factoring and Khan Academy: Polynomial algebra.

QUESTION NO: 77



What is the voltage across the load R and the current through R when the switch is open in the following circuit?

A. The current is 0A; the voltage is 10V.

B. The current is 2A; the voltage is 10V.

C. The current is 2A; the voltage is 2V.

D. The current is 0A; the voltage is 0V.

ANSWER: D

Explanation:

The current is 0A; the voltage is 0V. An open switch creates a break in the only conducting path of this series circuit. Because the path is incomplete, charge cannot make a continuous trip from the source, through the load resistor, and back to the source. Therefore, the current through R is zero amperes.

For an ideal resistor, the voltage across the resistor is determined by Ohm's law: $V_R = I \times R$. With I = 0 A and R = 5 Ω, the resistor voltage is $V_R = 0 \times 5 = 0$ V. The source voltage is not producing a voltage drop across R because no current is flowing through that component. Instead, in the idealized circuit, the source potential difference appears across the open switch—the location that interrupts the circuit path. This is a standard application of series-circuit behavior and Ohm's law: a resistor only has a nonzero voltage drop when current flows through it. For additional background, see the All About Circuits explanation of Ohm's law and the Physics Classroom discussion of voltage, current, and resistance.

QUESTION NO: 78

The email was succinct.

A. Lengthy

B. Concise

C. Confusing

D. Late

ANSWER: B

Explanation:

"Concise" is correct because *succinct* describes communication that conveys its meaning clearly in few words. A succinct email is brief and direct, containing only the details needed to communicate its purpose without unnecessary elaboration. In word-knowledge questions, the task is to identify the word or phrase with the closest meaning in the sentence's context. Here, the description applies to the length and efficient phrasing of the email, so "concise" is the precise synonym. Major dictionaries define *succinct* as marked by brevity and clarity, or expressed in few words. See the Merriam-Webster definition of "succinct" and the Cambridge Dictionary entry for "succinct".

QUESTION NO: 79

(12 yards + 14 feet) ÷ 5 = _____.

A. 12 feet

B. 5⅕ feet

C. 10 feet

D. 2½ yards

ANSWER: C

Explanation:

The correct answer is **10 feet**. To add measurements expressed in yards and feet, first convert them to a common unit. Since each yard contains 3 feet, 12 yards is equal to 36 feet. Adding the additional 14 feet gives a total of 50 feet. The expression then directs you to divide this total by 5: 50 feet ÷ 5 = 10 feet. The unit remains feet because a length measured

in feet is being divided by a plain number, rather than being converted to a different unit. This type of problem tests both customary-unit conversion and the order of operations: complete the addition inside the parentheses after expressing both quantities in the same unit, then perform the division. The yard-to-foot relationship is a standard U.S. customary measurement conversion; see the National Institute of Standards and Technology's length-unit reference. For additional guidance on converting between customary units, see Khan Academy's unit-conversion overview.

QUESTION NO: 80

The two types of diodes used in electronics work are the semiconductor diode and the _____.

A. vacuum tube diode

B. full-wave diode

C. half-wave diode

D. zener diode

ANSWER: A

Explanation:

The correct completion is **vacuum tube diode**. In broad introductory electronics classifications, a diode is a two-electrode device that conducts current primarily in one direction. Diodes have historically been made using two major technologies: vacuum tubes and semiconductor materials. A vacuum tube diode contains a heated cathode that emits electrons and an anode (plate) that collects them. When the plate is positive relative to the cathode, electrons can travel through the evacuated tube; reversing the polarity largely prevents that electron flow. This one-way behavior made vacuum tube diodes useful for rectifying alternating current, detecting signals, and protecting circuits in early electronic equipment.

Semiconductor diodes perform the same fundamental one-direction conduction function through a junction formed in semiconductor material, which is why they are the other broad category named in the question. Although semiconductor devices dominate modern electronics because they are compact and efficient, vacuum tube diodes remain an important foundational device type in electronics education and in some specialized or historical equipment. The U.S. Navy's NEETS module on electron tubes describes diode-tube operation, while the Encyclopaedia Britannica diode overview identifies both vacuum-tube and semiconductor forms.

QUESTION NO: 81

The primary purpose of piston rings is to _____.

A. seal the combustion chamber and allow the pistons to move freely.

B. connect the piston to the crankshaft.

C. allow fuel to enter the piston cylinder.

D. provide lubrication to the piston cylinder.

ANSWER: A

Explanation:

Piston rings primarily seal the small gap between the piston and the cylinder wall, helping contain high-pressure combustion gases within the combustion chamber. This seal is essential because the expanding gases produced during combustion must act on the piston to create the force that turns the crankshaft. Effective ring sealing also helps maintain compression, which supports efficient engine operation and power production. Piston rings are designed to slide against the cylinder wall as the piston travels up and down, while maintaining a controlled fit that allows this movement without excessive gas leakage. In addition to their primary sealing role, ring sets commonly assist with controlling the thin oil film on the cylinder wall and transferring heat from the piston to the cylinder wall. These supporting functions help protect moving engine parts and manage operating temperature, but sealing combustion pressure is the fundamental purpose addressed by this

question. The piston is connected to the crankshaft by the connecting rod, while fuel delivery is handled by the engine's intake and fuel-system components. For an overview of piston-ring functions and engine components, see Encyclopaedia Britannica's internal-combustion-engine components reference and How a Car Works: pistons and valves.

QUESTION NO: 82

Many criminal-law statutes permit more severe punishment of a person convicted of a crime if he or she intended to harm another person. For example, voluntary manslaughter carries a heavier penalty than involuntary manslaughter in most states. Planned crimes are also punished more severely than spur-of-the-moment crimes. The problem is that juries find it difficult to know what the intent of a person was at the time he or she committed a crime. Many defendants will deny that they intended to harm the other person and claim that any harm that occurred was "accidental." The law asks too much of juries when it expects them to determine what a person was thinking. Juries should only be asked to weigh objective evidence.

The author of this passage would agree that _____.

A. laws should not punish people based on intention

B. juries aren't intelligent enough to weigh evidence

C. more laws should distinguish between crimes committed with intent and crimes committed on the spur of the moment

D. lawyers will lie about anything

ANSWER: A

Explanation:

The passage supports "laws should not punish people based on intention" because the author's central concern is the difficulty—and, in the author's view, unfairness—of having juries determine a defendant's private mental state at the time of an offense. The passage acknowledges that criminal statutes commonly impose greater penalties when harmful intent or planning is found, but it then argues that such a determination asks jurors to decide what someone was thinking. Since a defendant can characterize harmful conduct as accidental and intent cannot be directly observed, the author believes the legal system should avoid making punishment depend on that subjective conclusion. The final sentence makes the author's preferred standard explicit: juries should weigh objective evidence only. Therefore, the author would favor a rule under which sentencing does not turn on a jury's finding about intent. In criminal law, intent is commonly discussed as part of the mental-state, or *mens rea*, element of an offense; see Cornell Law School's overview of mens rea and its definition of intent.

QUESTION NO: 83

Electricity is the most inefficient and costly way to heat a home. One kilowatt-hour of electricity creates about 3,400 British thermal units (BTUs). (BTUs are a standard heat measurement.) The price of electricity per kilowatt-hour is between $0.10 and $0.25 or between $29.35 and $73.13 per million BTUs.

In contrast, fuel oil, which produces 140,000 BTUs per gallon, costs about $8.33 to $13.89 per million BTUs. Natural gas, which produces 100,000 BTUs per therm, can be purchased for $5.00 to $22.50 per million BTUs. Oak firewood, which produces 26,000,000 BTUs per cord, costs $5.77 to $13.46 per million BTUs.

Choosing the right heating method for your home, based on the cost of fuel, may be more expensive at installation but will be cheaper in the long run.

According to the above passage, _____.

A. heating with fuel oil is always cheaper than other methods

B. oak firewood produces fewer BTUs per dollar than the other types of fuel

C. natural gas costs more than all other fuels except oak firewood

D. electricity is always the most expensive way to heat a house

ANSWER: D

Explanation:

“electricity is always the most expensive way to heat a house” is supported directly by both the passage’s main statement and its numerical comparison. The passage explicitly identifies electricity as the most costly heating method. It then expresses each fuel’s cost on the same basis—cost per one million BTUs—so the figures can be compared fairly regardless of whether the fuel is sold by kilowatt-hour, gallon, therm, or cord. Electricity costs from $29.35 to $73.13 per million BTUs. Its lowest stated cost, $29.35 per million BTUs, exceeds the highest stated cost for natural gas, $22.50, as well as the highest stated costs for fuel oil and oak firewood. Thus, throughout every price range supplied in the passage, electricity remains more expensive per unit of heat produced than each of the other listed fuels. This comparison also illustrates why heating costs should be evaluated by usable heat energy rather than simply by the purchase unit. A BTU is a standard measure of heat energy; the U.S. Energy Information Administration provides background on BTUs and household energy comparisons at EIA: British thermal units. The passage’s conclusion follows from comparing fuel costs on this common energy basis.

QUESTION NO: 84

Obstinate most nearly means _____.

A. depressing

B. destructive

C. confident

D. stubborn

ANSWER: D

Explanation:

“Stubborn” is correct because *obstinate* describes someone who firmly refuses to change their opinion, attitude, or course of action, even when others try to persuade them. An obstinate person is unyielding and difficult to influence; this is precisely the core meaning conveyed by “stubborn.” In vocabulary questions, “most nearly means” asks for the closest everyday synonym rather than a word that merely has a somewhat related tone. Here, “stubborn” directly preserves the essential idea of rigid persistence or resistance to changing one’s mind. Merriam-Webster defines *obstinate* as “sticking to an opinion, purpose, or course in spite of reason, arguments, or persuasion,” which aligns closely with stubbornness. The Cambridge Dictionary likewise describes it as being “unreasonably determined, especially to act in a particular way and not to change at all.” These definitions support selecting “stubborn” as the best synonym. See Merriam-Webster’s definition of obstinate and Cambridge Dictionary’s definition of obstinate.

QUESTION NO: 85

Which of the following is a prime number?

A. 27

B. 11

C. 8

D. 4

ANSWER: B

Explanation:

11 is a prime number because its only positive whole-number factors are 1 and 11. A prime number is a whole number greater than 1 that has exactly two positive factors: 1 and itself. To test a small number such as 11, check whether it can be

divided evenly by any prime number no greater than its square root. Because the square root of 11 is a little more than 3, it is enough to check divisibility by 2 and 3. Eleven is not even, so it is not divisible by 2, and its digits add to 2, so it is not divisible by 3. Therefore, no whole number other than 1 and 11 divides it evenly, confirming that 11 is prime. Recognizing primes is useful in ASVAB mathematics because it supports factorization, simplifying fractions, and reasoning about divisibility. The definition of prime numbers and examples are provided by Encyclopaedia Britannica and the Khan Academy lesson on recognizing prime numbers.

QUESTION NO: 86

Due process, the guarantee of fairness in the administration of justice, is part of the 5th Amendment to the U.S. Constitution. The 14th Amendment further requires states to abide by due process. After this amendment was enacted, the U.S. Supreme Court struck down many state laws that infringed on the civil rights guaranteed to citizens in the Bill of Rights.

According to the above passage, it's reasonable to assume that the 5th Amendment _____.

A. is about taxes

B. guarantees due process in all criminal and civil cases

C. guarantees due process in federal law

D. should never have become part of the Bill of Rights

ANSWER: C

Explanation:

The correct answer is **"guarantees due process in federal law."** The passage establishes that the Fifth Amendment contains a due-process guarantee, then explains that the Fourteenth Amendment was later needed to require *states* to observe due process. This distinction reasonably supports the conclusion that the Fifth Amendment's original due-process restriction applies at the federal level rather than directly regulating state action. In constitutional law, the Fifth Amendment states that no person may be deprived of life, liberty, or property without due process of law, and it is a limitation on the federal government. The Fourteenth Amendment contains its own Due Process Clause, which applies this protection to state governments. The passage's reference to Supreme Court decisions invalidating state laws after adoption of the Fourteenth Amendment reflects this federal-versus-state division of constitutional protections. The text of the Constitution can be reviewed through the Constitution Annotated: Fifth Amendment. For the corresponding state-level guarantee and its constitutional context, see the Constitution Annotated: Fourteenth Amendment.

QUESTION NO: 87

Which of the following screw heads requires a Phillips screwdriver? A.

B. C.

D.

Answer: B

Explanation:

A. C.
D.

B. The cross-shaped recess screw head.

ANSWER: B

Explanation:

The cross-shaped recess screw head requires a Phillips screwdriver. A Phillips drive has a cruciform, or cross-like, indentation designed to engage the matching cross-shaped tip of a Phillips driver. The driver's flared blades fit into the recess and transfer turning force to install or remove the fastener. This drive design was developed for powered assembly applications because the driver can center itself in the recess and is intended to cam out under excessive torque, helping reduce the chance of overtightening in some applications. In a visual identification question, look for a screw head with four intersecting slots that form a clear cross. That feature identifies the Phillips drive and distinguishes it from screw heads that use a single straight slot, a square recess, a hexagonal socket, or a star-shaped recess. Phillips drive geometry and its intended driver engagement are described by the Phillips Screw Company. Additional technical information on common screw-drive types is available from List of screw drives.

QUESTION NO: 88

The above tool is used to _____.

A. punch holes

B. drive nails

C. measure thickness

D. set nails

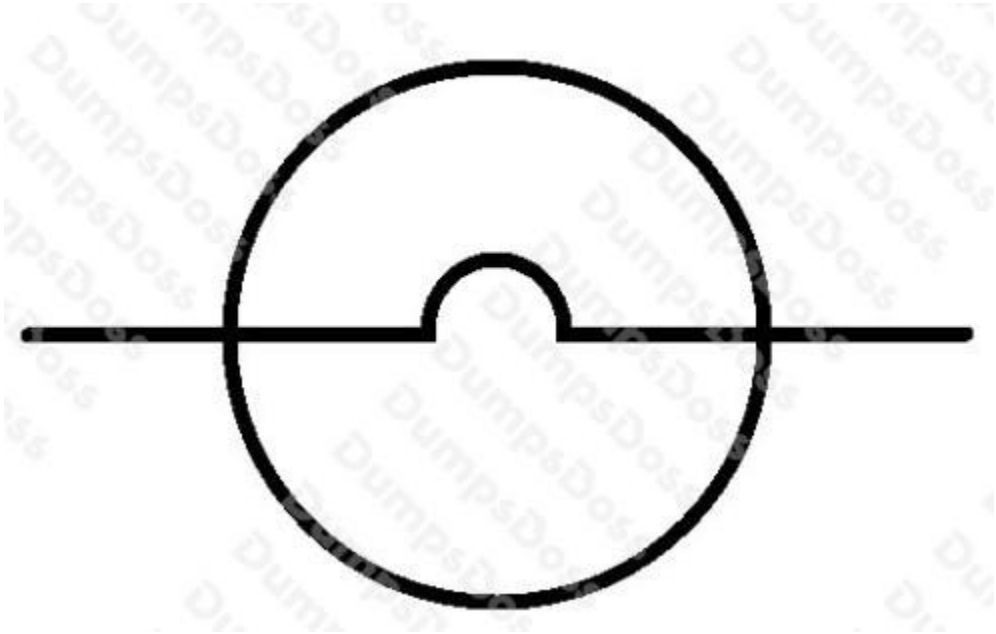
ANSWER: A

Explanation:

punch holes is correct. The pictured hand tool is a punch, designed to concentrate force at a small cutting or pointed end so that it can pierce material and create a hole. Punches are commonly used in shop work to make holes in materials such as leather, gasket stock, sheet material, or thin metal, depending on the particular punch style. A hollow punch removes a small circular piece of material, while pointed punches can pierce or mark material before further work is performed. In either case, the tool's primary operation is producing a hole through controlled impact or hand pressure.

This is an important distinction in basic tool identification: the intended function is determined by the punch's narrow working end and the way force is applied to it. The result is an opening in the workpiece that may be used for fastening, lacing, alignment, or subsequent machining. General guidance on hand-tool selection and safe use is available from the Occupational Safety and Health Administration's hand and power tools page. Additional information on punches and related hand tools is available in the Canadian Centre for Occupational Health and Safety hand-tools guidance.

QUESTION NO: 89



The symbol above is a/an _____.

A. lamp

B. fuse

C. inductor

D. bell

ANSWER: A

Explanation:

The correct identification is **lamp**. In standard circuit diagrams, a lamp is commonly represented by a circle containing a filament-like cross or similar marking, distinguishing it as a component intended to produce visible light when current passes through it. Lamps are electrical loads: they convert electrical energy primarily into light, while also producing some heat. Recognizing common schematic symbols is an important electronics skill because diagrams communicate a circuit's components and connections without requiring a realistic drawing of each physical part.

For ASVAB Electronics Information questions, identify the function suggested by the symbol and associate it with the conventional schematic representation. A lamp symbol indicates a light-producing device in the circuit, such as an indicator bulb or illumination load. The U.S. Department of Energy explains that electric lighting converts electrical energy into light, and the Electronics Tutorials reference illustrates conventional circuit-symbol usage for lamps and related components. See U.S. Department of Energy: Lighting Choices and Electronics Tutorials: DC Circuit Symbols.

QUESTION NO: 90

A man makes a 255-mile trip by car. He drives the first 2 hours at 45 miles per hour.

At what speed must he then travel for the remainder of the trip in order to arrive at his destination 5 hours after he started?

A. 31 miles per hour

B. 50 miles per hour

C. 51 miles per hour

D. 55 miles per hour

ANSWER: D

Explanation:

The correct answer is **55 miles per hour**. Use the distance formula: distance equals rate multiplied by time. During the first 2 hours, the driver travels 45 miles per hour × 2 hours = 90 miles. Since the entire trip is 255 miles, he has 255 − 90 = 165 miles remaining.

The required total travel time is 5 hours, and 2 of those hours have already elapsed. Therefore, only 3 hours remain to complete the final 165 miles. The needed speed is found by dividing the remaining distance by the remaining time: 165 miles ÷ 3 hours = 55 miles per hour. This calculation uses consistent units—miles for distance and hours for time—so the resulting unit is miles per hour. The trip's two portions are treated separately because the driver travels at different speeds during each portion. For a review of the relationship among distance, rate, and time, see Khan Academy's rate-problem overview and OpenStax's discussion of ratios and rates.

QUESTION NO: 91

Mainstream news reports, that focus on averting global warming, have asked questions such as "How much will this cost?" and "How much will we have to cut back on economic growth?" Such irresponsible and naive questions highlight the scale of self-interests and ignorance that dominate national debate. If we are not part of the solution (attempting to seriously reduce carbon emissions), then we are part of the problem (ignoring the serious consequences of global warming). Whatever the 'costs' are to save the planet, this will be our greatest challenge and our greatest investment and, if we fail in this task, then we will perish.

The author of the above passage would probably support _____.

A. people who ignore the consequences of global warming

B. the efforts of industry to limit carbon emissions

C. the idea that slowing global warming is simple

D. the consequences of global warming

ANSWER: B

Explanation:

The efforts of industry to limit carbon emissions is correct because the author explicitly argues that people must be "part of the solution" by seriously reducing carbon emissions. The passage rejects treating the financial cost or possible effects on economic growth as reasons to avoid climate action. Instead, it presents emissions reduction as an essential investment and a major collective challenge. Since industry is a major source of greenhouse-gas emissions and has substantial capacity to change energy use, production processes, and supply chains, efforts by industry to reduce those emissions directly fit the action the author endorses. The author's urgent language also shows that this support is not limited to inexpensive or convenient measures; the author believes meaningful action is necessary despite its costs. This inference is consistent with climate-science agencies' explanation that human activities, especially the burning of fossil fuels, increase greenhouse gases and drive warming. The U.S. Environmental Protection Agency describes the principal sources of U.S. greenhouse-gas emissions and the role of reducing them at EPA: Sources of Greenhouse Gas Emissions. The scientific basis for connecting carbon dioxide emissions to global warming is also summarized by NASA: Causes of Climate Change.

QUESTION NO: 92

What should you do if your temperature gauge on your car indicates that the car is overheating (in the red zone)?

A. Open radiator cap and pour in cold water immediately

B. Open radiator cap and pour in antifreeze immediately

C. Turn on the car's heater

D. Pull over and let the car cool down

ANSWER: D

Explanation:

“Pull over and let the car cool down

” is the correct response because a temperature gauge in the red zone indicates that the engine coolant temperature is dangerously high. Continuing to drive can rapidly worsen the overheating condition and may cause severe engine damage, including warped cylinder heads, damaged gaskets, or engine seizure. As soon as it is safe, pull off the road, stop the vehicle, and switch off the engine so heat production stops and the cooling system can gradually return to a safer temperature.

Allowing the engine to cool before inspecting anything is essential for safety. The cooling system is pressurized when hot, and hot coolant or steam can cause serious burns. Once the vehicle has cooled sufficiently, the driver can determine whether professional assistance is needed or whether there is an apparent issue such as a coolant leak. If steam is present, the engine has lost power, or the temperature remains high after cooling, arranging a tow is the prudent course of action. Guidance on responding safely to an overheating vehicle is available from Firestone Complete Auto Care and AAA.

QUESTION NO: 93

He promised us a diagnosis.

A. analysis

B. decision

C. dialect

D. diagram

ANSWER: A

Explanation:

In this sentence, “diagnosis” means a conclusion or identification reached after carefully examining evidence. Although the word is often used in medicine to identify a disease or condition, it can also apply more broadly to determining the nature or cause of a problem. “Analysis” is the best match because an analysis involves detailed examination of information in order to understand it and reach a reasoned finding. A promised diagnosis therefore implies that the person will examine the available facts and provide an informed assessment of what is happening. This relationship is especially close in medical contexts: a clinician analyzes symptoms, history, examination findings, and test results to make a diagnosis. Merriam-Webster defines diagnosis as the identification of a disease or condition by examination of symptoms, while its definition of analysis emphasizes detailed examination of something complex. Those meanings support “analysis” as the closest synonym in the context given. See Merriam-Webster: diagnosis and Merriam-Webster: analysis.

QUESTION NO: 94

A microwave is rated at 1,200 watts.

At 120 volts, how much current does it draw?

A. 1 amp

B. 10 amps

C. 100 amps

D. 1,440 amps

ANSWER: B

Explanation:

The correct answer is **10 amps**. Electrical power is found by multiplying voltage by current: power = voltage × current. Rearranging this relationship to solve for current gives current = power ÷ voltage. Substituting the microwave's stated values gives 1,200 watts ÷ 120 volts = 10 amperes.

This calculation uses the appliance's rated power and supply voltage, which is the standard approach for this type of electrical-information question. Watts measure the rate at which electrical energy is used, volts measure electrical potential difference, and amperes measure the flow of electric charge. Therefore, when a 1,200-watt appliance operates from a 120-volt source, its rated current draw is 10 amperes. In practical household use, actual current can vary somewhat during different operating modes, but the value obtained from the nameplate rating is the correct nominal current for the information provided. The power, voltage, and current relationship is summarized by Ohm's law and associated power formulas; see All About Circuits: Ohm's Law and U.S. Department of Energy: Understanding Electricity.

QUESTION NO: 95

A viral infection in humans that has a very long time between the initial exposure and the exhibiting of symptoms is _____.

A. AIDS

B. measles

C. pneumonia

D. chicken pox

ANSWER: A

Explanation:

AIDS is the intended answer because it results from infection with human immunodeficiency virus (HIV), which can have a prolonged clinical latency period. After HIV is acquired, a person may have no noticeable symptoms for years while the virus continues to affect the immune system. Without effective treatment, HIV gradually damages CD4 T cells, weakening immune defenses. AIDS, or acquired immunodeficiency syndrome, is the advanced stage of HIV infection and is diagnosed when immune damage becomes severe or certain opportunistic illnesses occur. This extended interval between exposure, infection, and the development of serious observable illness is the key feature described in the question. The exact time course varies substantially among individuals and is strongly affected by access to and use of antiretroviral therapy. Modern treatment can suppress HIV replication, protect immune function, and prevent progression to AIDS. The U.S. HIV.gov overview explains the stages of HIV infection and notes that chronic HIV infection may persist for many years without treatment: HIV.gov: What Are HIV and AIDS?. Additional clinical information on HIV stages is available from the CDC.

QUESTION NO: 96

Punches are used in sheet metal work to _____.

A. flatten the metal

B. make holes in the metal

C. groove the metal

D. snip the metal

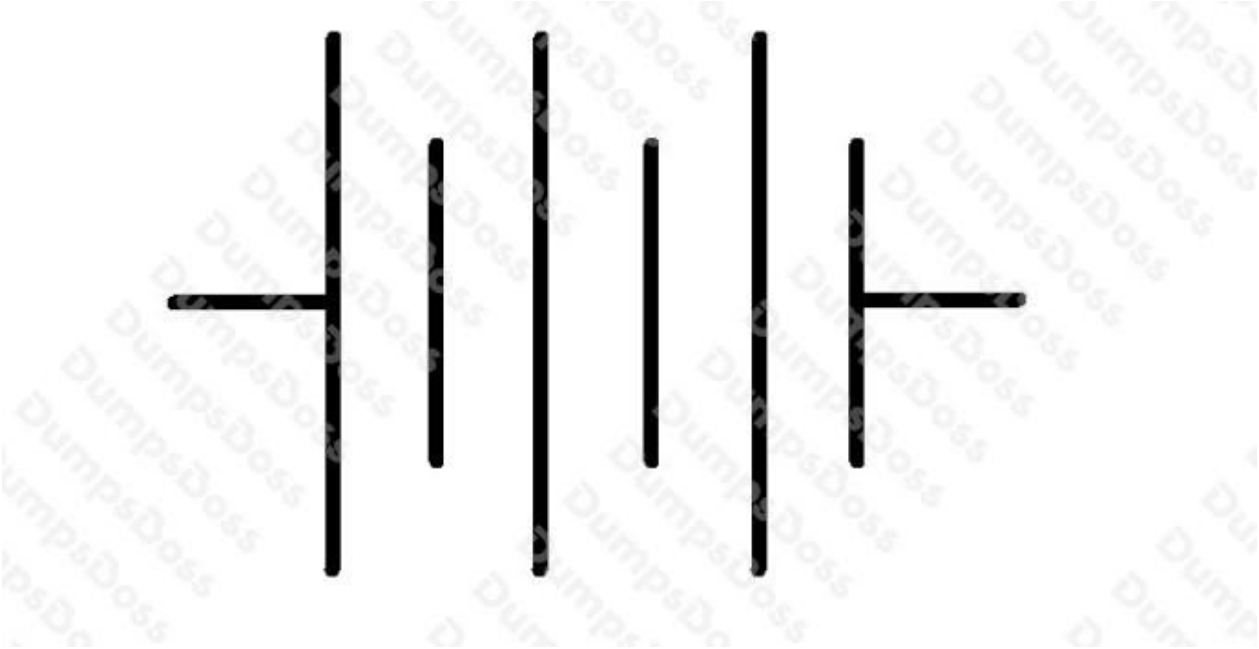
ANSWER: B

Explanation:

"make holes in the metal" is correct. In sheet-metal work, a punch is a hardened tool that is driven into or through material to create a hole, often used with a matching die that supports the metal and produces a clean, accurately sized opening. Punches are selected according to the desired hole diameter and the sheet's material and thickness; proper support beneath

the sheet helps prevent excessive distortion around the opening. Hole-making is a basic fabrication operation needed before parts can be fastened with bolts, screws, rivets, or other hardware. In common hand-tool use, a center punch may first make a small indentation to locate a subsequent drilling operation accurately, while hollow punches and punch-and-die sets can directly cut holes in thin sheet metal. This fundamental function is consistent with standard shop-tool guidance: punches are intended to mark locations or form openings in a workpiece. See the OSHA Hand and Power Tools guide for general safe use of hand tools, and the RoyMech sheet-metal working reference for an overview of sheet-metal punching operations.

QUESTION NO: 97



Insulated fittings can be used to splice wires, thus eliminating the need for _____.

A. cleaning the wires

B. removing the plastic coating from the wires

C. twisting the wires together

D. soldering the wires together

ANSWER: D

Explanation:

Insulated fittings can be used to splice conductors mechanically and electrically without applying solder, so “soldering the wires together” correctly completes the statement. Common insulated splice connectors, such as crimp butt connectors, contain a metal sleeve that is compressed around properly stripped wire ends. The crimp creates a secure low-resistance electrical connection, while the surrounding insulation helps protect the joint from accidental contact and short circuits. This makes the connection process faster and avoids the heat, molten solder, flux, and cooling time associated with a soldered splice. Proper crimping still requires the conductors to be prepared according to the connector instructions and the correct crimping tool to be used; the key point is that the fitting itself provides the permanent joining method rather than solder. The U.S. Occupational Safety and Health Administration’s electrical guidance emphasizes using approved equipment and making electrical connections safely: OSHA Electrical Safety. For a technical overview of crimped wire connections and connector selection, see TE Connectivity’s resource page: TE Connectivity Crimp Connectors.

QUESTION NO: 98

The grocery store orders ibuprofen in bottles by the gross. The first day after stocking the shelves with a new shipment they sold 5 bottles. The next day they sold 8 and the third day 7.

How many bottles remain from the original order?

A. 124

B. 131

C. 104

D. 100

ANSWER: A

Explanation:

124 is correct because a gross is a standard counting unit equal to 144 items, or twelve dozen. The original shipment therefore contained 144 bottles. To find how many bottles remain, first add the bottles sold over the three days: 5 + 8 + 7 = 20 bottles sold. Then subtract the total sold from the original number of bottles: 144 − 20 = 124. Thus, 124 bottles remain from the original gross order. This problem tests recognition of the unit “gross” and straightforward arithmetic with a starting quantity and successive sales. The National Institute of Standards and Technology’s unit reference lists a gross as 144, supporting the required conversion before performing the subtraction. See the NIST guide to units outside the SI and the Britannica Dictionary definition of gross.

QUESTION NO: 99

What is Newton’s Third Law of Motion?

A. What goes up must come down.

B. For every action, there is an equal and opposite reaction.

C. Reactions are a result of large actions.

D. Mass cannot be destroyed.

ANSWER: B

Explanation:

Newton’s Third Law of Motion is correctly expressed by: “For every action, there is an equal and opposite reaction.” More precisely, when one object exerts a force on another object, the second object simultaneously exerts a force of equal magnitude in the opposite direction on the first object. These two forces are called an action–reaction pair. They act on two different objects, so they do not cancel each other out on a single object. For example, when a person pushes backward on the ground while walking, the ground pushes forward on the person with an equal force; this forward force helps propel the person ahead. Similarly, a rocket expels gas downward, and the gas exerts an equal upward force on the rocket. This law describes force interactions and applies whether the objects are moving or at rest. NASA provides an accessible discussion of Newton’s laws and action–reaction force pairs at NASA Glenn Research Center. A formal statement and additional examples are also available from Encyclopaedia Britannica.

QUESTION NO: 100

When you heat water that is confined in a closed container so that the steam cannot escape, the pressure inside the container _____ and the temperature of the boiling water _____.

A. increases, decreases

B. increases, increases

C. decreases, decreases

D. decreases, increases

ANSWER: B

Explanation:

“increases, increases” is correct. In a closed container, water vapor cannot freely escape, so continued heating adds energy to the system and raises the vapor pressure. Water boils when its vapor pressure equals the pressure acting on its surface. As confinement causes the internal pressure to rise, the boiling point also rises. Therefore, water that continues boiling under the higher pressure reaches a temperature above its normal boiling temperature at atmospheric pressure.

This pressure–temperature relationship is the operating principle of a pressure cooker: trapping steam raises the pressure, which permits liquid water to boil at a higher temperature. The same physical principle applies to a properly designed closed vessel containing water and steam in equilibrium. The temperature does not remain fixed at 100°C unless the pressure remains at standard atmospheric pressure. For an explanation of vapor pressure and its relationship to boiling, see Encyclopaedia Britannica: vapor pressure. The pressure-cooker application is also described by USDA: Pressure Cooking and Food Safety.

QUESTION NO: 101

A clutch is a type of _____.

A. universal joint

B. coupling

C. gear differential

D. cam follower

ANSWER: B

Explanation:

A clutch is a type of coupling because it is a mechanical device used to selectively connect and disconnect a driving shaft from a driven shaft. When the clutch is engaged, it transmits engine torque through the drivetrain so power can reach the transmission and, ultimately, the wheels. When it is disengaged, it interrupts that torque transfer while the engine can continue running. This controlled coupling action permits smooth starting from rest and allows the driver to change gears without requiring the engine and transmission to remain continuously locked together.

In a common manual-transmission vehicle, friction surfaces in the clutch assembly are pressed together by spring force to create enough friction to carry rotational force. Depressing the clutch pedal releases that clamping force, separating the engine from the transmission input shaft. Thus, although clutches may use different designs—including friction, dog, hydraulic, or electromagnetic mechanisms—their essential function is to couple and uncouple rotating components on demand. This is the defining feature that makes “coupling” the correct classification. See Encyclopaedia Britannica’s overview of clutches and How a Car Works: How a clutch works.

QUESTION NO: 102

Kevin’s dad said he would contemplate the decision before giving an answer.

To contemplate most nearly means _____.

A. observe

B. disregard

C. ponder

D. discount

ANSWER: C

Explanation:

“Ponder” is correct because *contemplate* means to think about something carefully and for a period of time, especially before reaching a decision. In the sentence, Kevin’s dad does not answer immediately; he intends to give the decision deliberate, serious thought first. That action is precisely what it means to ponder a matter.

This is a vocabulary-in-context question, so the surrounding phrase “before giving an answer” provides an important clue. It shows that the word describes a mental process of reflection and consideration rather than simply noticing something or taking action. Major dictionaries define *contemplate* in this sense as thinking deeply or carefully about something. Merriam-Webster lists “ponder” among the meanings of contemplate, and Cambridge Dictionary similarly defines it as considering something carefully for a long time. See Merriam-Webster: contemplate and Cambridge Dictionary: contemplate.

QUESTION NO: 103

You’re getting in shape for a marathon and are going to use the local school track to build up to more mileage. The track measures one quarter mile around.

If you ran 18 laps, how many miles would this be?

A. 4 miles

B. 3.50 miles

C. 4.50 miles

D. 3.75 miles

ANSWER: C

Explanation:

The correct answer is **4.50 miles**. Each lap is one quarter of a mile, which can be written as 0.25 mile. To find the total distance, multiply the number of laps by the distance per lap: 18 × 0.25 = 4.5. Another way to see this is that four quarter-mile laps make one full mile. Dividing 18 laps into groups of four gives 4 complete miles (16 laps), with 2 laps remaining. Those final 2 laps equal two quarters of a mile, or one half-mile. Therefore, the total distance is 4 miles plus 0.5 mile, which equals 4.50 miles. This type of problem tests multiplication involving fractions and decimals, a key Arithmetic Reasoning skill on the ASVAB. For additional practice with fractions, decimals, and basic arithmetic concepts, review the Khan Academy fractions overview and the Khan Academy decimals overview.

QUESTION NO: 104

If 5 apples cost $2.00, how much will 15 apples cost?

A. $8

B. $30

C. $10

D. $6

ANSWER: D

Explanation:

The correct answer is **$6**. This is a proportional-price problem: assuming every apple has the same unit price, increasing the number of apples by a factor increases the total cost by that same factor. Fifteen apples is three groups of five apples, because 15 ÷ 5 = 3. Since each group of five costs $2.00, multiply $2.00 by 3: 3 × $2.00 = $6.00. Equivalently, the price per apple is $2.00 ÷ 5 = $0.40 per apple; then 15 × $0.40 = $6.00. This use of a constant rate is a core arithmetic-reasoning skill assessed on the ASVAB. The official ASVAB program describes Arithmetic Reasoning as measuring the ability to solve basic arithmetic word problems, including problems involving rates and proportional relationships. For additional practice with

ratios, rates, and proportions, see the Khan Academy ratios and rates resources. Information about ASVAB testing and subtests is available from the official ASVAB website.

QUESTION NO: 105

The mechanical advantage of a winch is the ratio of the radius of the crank to the radius of the _____.

A. arm

B. lever

C. fulcrum

D. shaft

ANSWER: D

Explanation:

The correct completion is **shaft**. A winch operates according to the principle of torque: a force applied at a distance from an axis produces a turning effect equal to the force multiplied by its perpendicular distance from that axis. When an effort is applied to the crank handle, its moment arm is the crank radius. The rope or cable is wound around the shaft (or drum), so the load acts at the shaft radius. Because the crank and shaft rotate together, the input and output turn through the same angle. In an ideal winch, equating the input torque to the load torque gives effort × crank radius = load × shaft radius. Therefore, the mechanical advantage—load force divided by effort force—is crank radius divided by shaft radius. A longer crank or a smaller shaft increases the mechanical advantage, allowing a person to lift or pull a larger load with less applied force, although the handle must travel a greater distance. This is the same work-distance tradeoff seen in other simple machines. For a general treatment of torque and rotational equilibrium, see OpenStax Physics: Newton's Second Law for Rotation. The relationship between force, distance, and mechanical advantage is also summarized by NASA Glenn Research Center: Mechanical Advantage.

QUESTION NO: 106

The significance of a saw having more teeth or points is that _____.

A. it can cut more efficiently on thick and rough surfaces

B. it can cut on smaller objects

C. it prevents the material being cut from breaking apart

D. it can cut more finely

ANSWER: D

Explanation:

"it can cut more finely" is correct because tooth count directly affects the finish and precision of a saw cut. A blade with many small, closely spaced teeth removes a smaller amount of material with each tooth as it passes through the workpiece. This produces a narrower, smoother-looking kerf and reduces tearing or splintering along the cut line. For this reason, high-tooth-count blades are commonly selected when a clean finish is important, such as when cutting trim, plywood veneer, or other material that will remain visible.

In saw terminology, this characteristic is often expressed as teeth per inch for hand saws and reciprocating saw blades, or as total tooth count for circular and miter-saw blades. Higher tooth counts generally correspond to finer cutting action, while the exact blade choice must also suit the material and the type of cut. Manufacturers' blade-selection guidance similarly identifies higher tooth counts as appropriate for smoother, finer finishes. See LENOX Reciprocating Saw Blade Selection Guide and Diablo circular saw blade guidance.

QUESTION NO: 107

Puerile most nearly means _____.

A. dangerous

B. illegal

C. childish

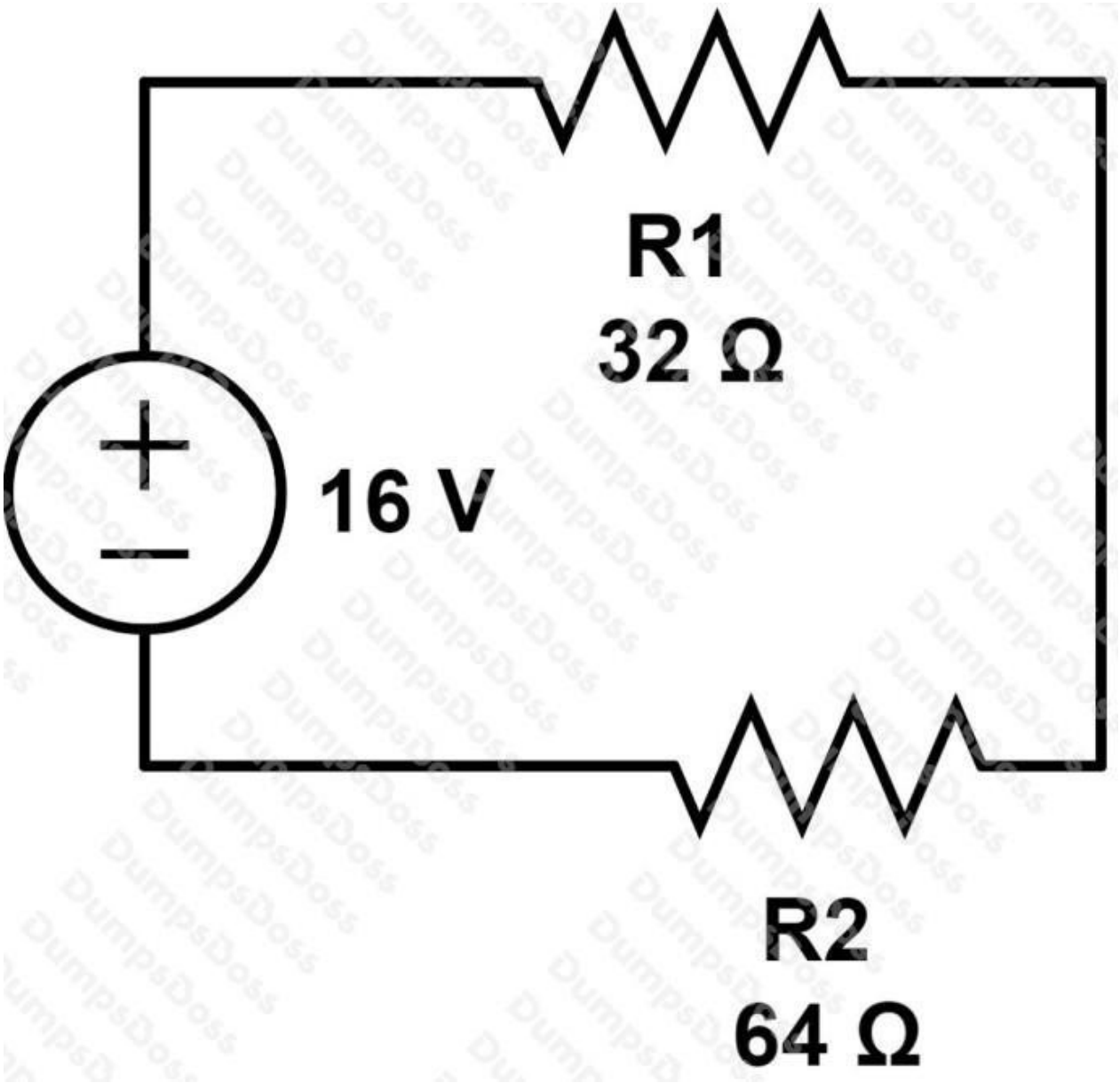
D. automatic

ANSWER: C

Explanation:

“Childish” is correct because *puerile* describes behavior, ideas, humor, or attitudes characteristic of a child, especially in a way that seems immature, trivial, or silly for an adult. The word comes from the Latin *puer*, meaning “boy” or “child,” which reinforces its connection to childishness. In vocabulary questions, “most nearly means” asks for the closest common-language equivalent rather than an exact dictionary substitution in every context. For example, puerile remarks are immature or childishly silly remarks. Merriam-Webster defines *puerile* as “childish, immature,” and Cambridge Dictionary similarly identifies it as describing behavior that is silly or childish. These definitions directly support “childish” as the best match. See Merriam-Webster: puerile and Cambridge Dictionary: puerile.

QUESTION NO: 108



Given the electrical circuit in the image provided, what is the current in resistor R1?

A. 0.5 amperes

B. 7.66666666661 amperes

C. 0.25 amperes

D. 0.16666666667 amperes

ANSWER: D

Explanation:

The current in resistor R1 is **0.16666666667 amperes**, which is approximately 0.167 A, or one-sixth of an ampere. Determine this by first reducing the circuit shown to the equivalent resistance seen by the voltage source. Then apply Ohm's law, $I = V/R$, using the source voltage and the applicable total resistance. This produces a circuit current of 1/6 A. Because R1 is on the same series current path represented in the circuit, the current through R1 equals that calculated circuit current; charge cannot accumulate at an ordinary series connection, so the same rate of charge flow passes through each component in that path. Current is measured in amperes and represents the amount of electric charge passing a point per unit time. The result may be written exactly as 1/6 A, as a repeating decimal, or rounded appropriately to about 0.17 A. For background on Ohm's law and circuit-current calculations, see OpenStax: Ohm's Law, Resistance, and Simple Circuits and All About Circuits: Series Circuits.

QUESTION NO: 109

What structure connects muscle to bone?

A. tendons

B. joints

C. cartilage

D. ligaments

ANSWER: A

Explanation:

Tendons are the structures that connect muscles to bones. They are strong bands of dense connective tissue located at the ends of many skeletal muscles. When a muscle contracts, it pulls on its tendon; the tendon then transmits that pulling force to the bone. This produces movement at a joint, such as bending the elbow when the biceps muscle contracts and pulls through its tendon on the forearm bones. Tendons must be highly durable because they repeatedly carry substantial tensile forces generated during normal activities such as walking, lifting, and running. Their collagen-rich composition provides the strength needed to transfer muscular force efficiently while allowing a small degree of flexibility. This muscle-to-tendon-to-bone arrangement is a central feature of the musculoskeletal system and enables voluntary body movement. The National Cancer Institute's definition of a tendon identifies it as tissue that attaches muscle to bone: NCI Dictionary of Cancer Terms: tendon. Additional anatomy information is available from StatPearls: Anatomy, Tendons.

QUESTION NO: 110

Which mechanical components are typically used between a wheel and an axle to reduce friction?

A. springs

B. hinges

C. bearings

D. levers

ANSWER: C

Explanation:

Bearings are the mechanical components typically placed between a wheel and its axle to reduce friction. In a common wheel-and-axle arrangement, the wheel and axle would otherwise slide against each other as the wheel turns. Bearings introduce rolling elements, such as balls or rollers, held between inner and outer races. This changes much of the contact from sliding friction to rolling friction, allowing the wheel to rotate more smoothly and with less resistance. Lubricant such as grease or oil is commonly used with bearings to further minimize friction, reduce wear, limit heat buildup, and help protect the moving parts from contamination and corrosion. This basic principle is used in many vehicles and machines, including bicycle wheels, automotive wheel hubs, electric motors, and conveyor rollers. The U.S. Navy's training material on bearings describes their function as supporting rotating shafts while reducing friction, and the Encyclopaedia Britannica overview of machine elements likewise identifies bearings as components that constrain relative motion while minimizing friction. See Encyclopaedia Britannica: bearing and Naval Surface Warfare Center, Carderock Division.

QUESTION NO: 111

Most 12V car battery are made up of six individual cells connected in series.

What is the voltage of each cell in a car battery?

A. 2V

B. 3.5V

C. 6V

D. 12V

ANSWER: A

Explanation:

2V is correct. A conventional 12-volt automotive lead-acid battery contains six electrochemical cells connected in series. In a series circuit, the voltage supplied by each cell adds to produce the battery's total nominal voltage. Therefore, dividing the nominal 12 volts by six cells gives a nominal value of 2 volts per cell.

The term "12V battery" is a nominal designation rather than its exact voltage at every state of charge. A fully charged lead-acid cell typically has an open-circuit voltage of about 2.1 volts, so a fully charged six-cell battery commonly measures approximately 12.6 volts. Nevertheless, for automotive-service and ASVAB-style questions, the standard rated voltage of an individual lead-acid battery cell is 2V. This relationship is important when checking battery condition and understanding why failure of a single cell substantially reduces the overall battery voltage. The U.S. Department of Energy describes lead-acid batteries as having a nominal cell voltage of about 2 volts, and Interstate Batteries notes that six cells make up a 12-volt automotive battery.

References: U.S. Department of Energy: How Does a Lead Acid Battery Work?; Interstate Batteries: How Do Car Batteries Work?

QUESTION NO: 112

Jill bought 2 cases of computer paper (10 reams per case) on sale for $85.00. The regular rate is: 1 case = $52.50.

What was her savings amount on the cost of each ream?

A. $1.00 per ream savings

B. $1.25 per ream savings

C. $0.75 per ream savings

D. $0.50 per ream savings

ANSWER: A

Explanation:

$1.00 per ream savings is correct. At the regular price, two cases would cost $105.00 because each case costs $52.50 and Jill bought two cases. Her sale price was $85.00, so her total savings were $20.00. Each case contains 10 reams, and two cases therefore contain 20 reams. Dividing the total savings by the total number of reams gives $20.00 ÷ 20 = $1.00 saved on each ream. This approach first compares the regular total cost with the sale total cost, then finds the unit savings by dividing by the total quantity purchased. It is the appropriate method for a word problem asking for a per-item amount when multiple packages are bought. For a review of unit rates and dividing a total amount by a number of units, see Khan Academy's unit-rate overview. For additional practice with percentage, ratio, and rate concepts used in arithmetic reasoning, see OpenStax Prealgebra: Ratios and Proportions.

QUESTION NO: 113

You just went on a blind date and wanted to impress the girl by adding an 18% tip to the total cost of the meal. Two entrees came to a total of $35.90. Desserts cost $7.50 and beverages cost $6.60.

What is the 18% tip going to cost?

A. $5.00

B. $7.75

C. $8.50

D. $9.00

ANSWER: D

Explanation:

$9.00 is correct. First, find the complete pre-tip meal cost by adding the entrees, desserts, and beverages: $35.90 + $7.50 + $6.60 = $50.00. A tip of 18% means multiplying the meal total by 0.18, since 18 percent is equivalent to 18/100, or 0.18. The calculation is $50.00 × 0.18 = $9.00. Therefore, the amount added as the tip—not the entire bill including the tip—is $9.00. This also can be checked mentally: 10% of $50 is $5, and 8% is $4, so 18% totals $9. Working from the full meal subtotal before applying the percentage is the key arithmetic step in this type of ASVAB Arithmetic Reasoning problem. For a review of converting percentages to decimals and calculating a percentage of a quantity, see Khan Academy's percentage guide. The official ASVAB program overview is available from Official ASVAB.

QUESTION NO: 114

What is the state known as equilibrium?

A. Equilibrium describes the action of two similar forces coming together.

B. Equilibrium describes the state in which equal and opposing forces balance, resulting in zero net force.

C. Equilibrium describes the action of two opposing forces coming together in a crash.

D. Equilibrium describes the state created by the coming together of parallel forces.

ANSWER: B

Explanation:

Equilibrium is the condition in which all forces acting on an object balance so that the net force is zero. In practical terms, this means the object has no acceleration: if it is at rest, it remains at rest; if it is already moving, it continues at a constant velocity unless an unbalanced force acts on it. For a rigid object such as a beam, ladder, or vehicle component to be in complete static equilibrium, the forces must balance and the turning effects, called torques or moments, must also balance. Equal forces alone are not sufficient unless they act in opposite directions in a way that produces zero net force. Thus, the accurate description is the state in which forces of equal magnitude balance one another, resulting in equilibrium. This principle is central to mechanical comprehension because it explains why supported objects can remain stable and why a change in force or its point of application can cause motion or rotation. See OpenStax: Conditions for Static Equilibrium and NASA: Forces and Balance.

QUESTION NO: 115

Four friends split the cost of a $78.60 hotel room equally.

How much does each friend pay?

A. $18.65

B. $19.15

C. $19.65

D. $20.65

ANSWER: C

Explanation:

The correct answer is **$19.65**. Because the four friends divide the cost equally, divide the total room cost by 4: $78.60 ÷ 4 = $19.65. Therefore, each friend pays $19.65.

QUESTION NO: 116

Which principle of mechanical motion is used in the design of a roller coaster?

A. momentum

B. friction

C. acceleration

D. all of the above

ANSWER: D

Explanation:

“all of the above” is correct because roller-coaster design requires engineers to account for momentum, friction, and acceleration. A coaster train gains speed as gravitational potential energy is converted into kinetic energy on a descent. Its momentum, the product of its mass and velocity, affects how it continues through track elements such as hills, curves, and loops. Designers must ensure the train has sufficient energy and speed to complete the course safely under expected operating conditions. Acceleration is also fundamental because riders and the train experience changes in velocity in both magnitude and direction; these changes create the g-forces that must remain within safe, intended limits. Friction and aerodynamic drag continuously remove mechanical energy from the train, so they affect track-profile calculations and are especially important when designing braking systems that bring the train to a controlled stop. In practice, coaster engineering applies these connected mechanics principles together rather than treating any one of them in isolation. The National Academies’ explanation of forces and motion provides useful background on how forces cause acceleration: National Academies: Forces and Motion. For an overview of the energy transformations that power a roller coaster after its initial lift, see The Physics Classroom: Roller Coaster Physics.

QUESTION NO: 117

What large halogen is essential for the function of the thyroid gland?

A. potassium chloride (salt)

B. hemoglobin

C. calcium

D. iodine

ANSWER: D

Explanation:

Iodine is essential for normal thyroid-gland function because the thyroid uses it as a raw material to produce the hormones thyroxine (T4) and triiodothyronine (T3). These hormones contain iodine atoms and help regulate metabolic rate, energy use, body temperature, growth, and nervous-system development. Dietary iodine is absorbed into the bloodstream, and thyroid cells actively concentrate it from the blood. The gland then incorporates iodine into the amino acid tyrosine within thyroglobulin, a key step in synthesizing T3 and T4. Because the body does not make iodine, it must be obtained through food or iodized salt. Adequate intake is particularly important during pregnancy and childhood, when thyroid hormones support normal brain development and growth. The National Institutes of Health identifies iodine as an essential trace element required for thyroid hormone production, and the American Thyroid Association likewise explains its central role in thyroid health. Although iodine is a halogen, its biological importance here comes specifically from its incorporation into

thyroid hormones. See the NIH Office of Dietary Supplements iodine fact sheet and the American Thyroid Association's iodine-deficiency overview.

QUESTION NO: 118

What would happen to a balloon full of air if you moved it from above a water surface to ten feet below the water surface?

A. The balloon would explode.

B. The volume of the balloon would decrease.

C. The volume of the balloon would increase.

D. The volume of the balloon would stay the same.

ANSWER: B

Explanation:

The volume of the balloon would decrease. At ten feet below the water's surface, the balloon is subject to greater pressure than it experiences in the air above the surface. Water pressure increases with depth because the weight of the water overhead produces an added force on objects underwater. This external pressure pushes inward on the flexible balloon material. The air inside the balloon is compressible, so it occupies less space until its internal pressure increases enough to balance the surrounding water pressure.

This relationship is described by Boyle's law: for a fixed amount of gas at approximately constant temperature, pressure and volume vary inversely. As the pressure on the balloon increases during descent, its volume decreases. The effect can be noticeable even at relatively shallow depths such as ten feet, where the water adds pressure beyond normal atmospheric pressure. This is the same basic physical principle that affects air-filled objects and buoyancy while diving. For background on pressure in fluids, see NASA Glenn Research Center's fluid-pressure resource. Boyle's law is also summarized by Encyclopaedia Britannica.

QUESTION NO: 119

The speed of light in a vacuum is about _____.

A. 186,000 miles per hour

B. 186,000 kilometers per hour

C. 186,000 miles per second

D. 186,000 feet per second squared

ANSWER: C

Explanation:

The speed of light in a vacuum is about 186,000 miles per second. In SI units, its exact defined value is 299,792,458 meters per second, which converts to approximately 186,282 miles per second. For an ASVAB-level general-science question, 186,000 miles per second is the appropriate rounded value. "In a vacuum" is important because light travels at its maximum speed, conventionally represented by *c*, when it is not passing through matter. This constant is fundamental to physics and is used in calculations involving electromagnetic waves, astronomy, and relativity. The National Institute of Standards and Technology lists the speed of light in vacuum as exactly 299,792,458 m/s, and NASA provides the commonly used approximation of 186,000 miles per second. See NIST: speed of light in vacuum and NASA Science: Universe overview.

QUESTION NO: 120

You are working in a hospital supply room and make $13.65 an hour. The union negotiates a new contract giving each employee a 4.3% cost of living raise.

What is your new hourly rate?

A. $14.59 an hour

B. $14.33 an hour

C. $14.24 an hour

D. $14.43 an hour

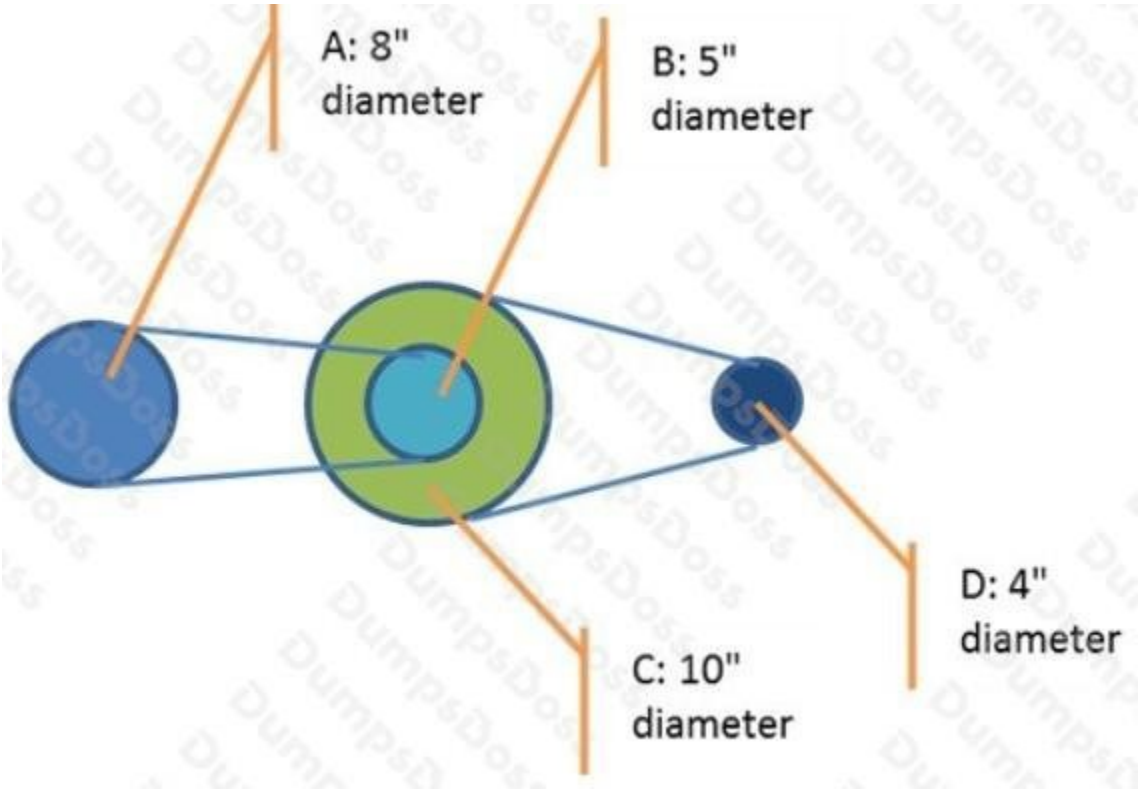
ANSWER: C

Explanation:

$14.24 an hour is correct. A 4.3% raise means the original hourly wage increases by 4.3% of its current amount. First, convert 4.3% to its decimal form: 0.043. Then calculate the raise amount: $13.65 × 0.043 = $0.58695. Add that increase to the original hourly rate: $13.65 + $0.58695 = $14.23695. Because hourly pay is stated in dollars and cents, round the result to the nearest cent. The third decimal place is 6, so the cents value rounds up from 23 cents to 24 cents. Therefore, the new hourly rate is $14.24 per hour. The same calculation can be written more efficiently by multiplying the original wage by 1.043, where 1 represents the original 100% of pay and 0.043 represents the 4.3% increase: $13.65 × 1.043 = $14.23695, which rounds to $14.24. For a review of converting percentages to decimals and calculating percent increases, see OpenStax Prealgebra: Understand Percentages and Khan Academy: Percent Increase and Decrease.

QUESTION NO: 121

In the pulley system below, how fast does pulley D rotate, if pulley A rotates at 50 rpm?



A. 100 rpm

B. 50 rpm

C. 200 rpm

D. 64 rpm

ANSWER: C

Explanation:

200 rpm is correct. In an ideal belt-drive system without belt slip, the belt's linear speed is the same at both pulleys it connects. Therefore, rotational speed changes inversely with pulley diameter: a smaller driven pulley turns faster than the larger driving pulley. The diagram shows pulley A with an 8-unit diameter driving pulley B with a 5-unit diameter. Starting with A at 50 rpm, pulley B rotates at 50 × (8 ÷ 5), or 80 rpm.

Pulleys B and C are fixed to the same shaft, so they must have the same angular speed. Thus, pulley C also rotates at 80 rpm. Pulley C, which has a 10-unit diameter, drives pulley D, which has a 4-unit diameter. Applying the same diameter-to-speed relationship gives D's speed as 80 × (10 ÷ 4) = 200 rpm. This result follows from conserving belt speed through each belt connection and recognizing that a common shaft transmits the same rotational speed to both attached pulleys. For background on belt-drive velocity ratios, see Engineering ToolBox: Belt Drives and OpenStax Physics: Rotational Variables.

QUESTION NO: 122

What should the temperature of a typical soldering iron be when joining two wires together?

A. 200 to 300 degrees Fahrenheit

B. 400 to 500 degrees Fahrenheit

C. 500 to 600 degrees Fahrenheit

D. 700 to 800 degrees Fahrenheit

ANSWER: C

Explanation:

A typical soldering iron temperature of 500 to 600 degrees Fahrenheit is appropriate for joining ordinary wires in a basic electronics or electrical-work setting. This range is hot enough for the iron tip to transfer heat efficiently into both conductors and bring the joint to the temperature needed for common tin-lead solder to flow. The objective is to heat the wires themselves—not merely melt solder against the iron—so that the solder wets the clean metal surfaces and forms a sound electrical and mechanical connection. A tip temperature in this general range also provides practical working time for a small wire joint without requiring prolonged heating that could damage insulation or nearby components. Exact settings can vary with solder alloy, wire gauge, tip size, and the thermal mass of the connection, but 500 to 600 degrees Fahrenheit is the intended typical range for this question. Kester's soldering guidance discusses selecting tip temperature based on the solder alloy and the heat demands of the joint: Kester—Soldering Iron Temperature. NASA workmanship requirements likewise emphasize using controlled soldering processes to achieve reliable connections: NASA-STD-8739.3, Soldered Electrical Connections.

QUESTION NO: 123

Doctors and experts recommend that an aspirin a day may cut the risk of developing colon cancer. However, a smaller dose of baby aspirin may be more effective at this than a full size aspirin.

A full size aspirin _____.

A. does not cut the risk of developing colon cancer

B. prevents colon cancer

C. may cut the risk of colon cancer

D. is not as effective as a baby aspirin

ANSWER: C

Explanation:

The statement “may cut the risk of colon cancer” is correct because it follows directly from the passage’s first sentence: doctors and experts recommend that taking an aspirin daily may reduce the risk of developing colon cancer. A full-size aspirin is still an aspirin, so the general statement includes it. The passage uses cautious language—“may cut the risk”—which appropriately reflects a possible reduction in risk rather than a guarantee of prevention. The additional detail about baby aspirin says that a smaller dose *may* be more effective at reducing this particular risk. That comparison does not remove the stated potential benefit of a full-size aspirin; it only suggests that the smaller dose could provide a greater benefit. This is a paragraph-comprehension inference question, so the best completion preserves both the subject of the passage, colon-cancer risk, and its qualified level of certainty. Medical evidence on aspirin and cancer prevention is also generally described in qualified terms, because benefits and risks depend on the individual and the dose. See the National Cancer Institute’s overview of aspirin and cancer prevention and its fact sheet on aspirin use.

QUESTION NO: 124

A sales manager buys antacid in bottles by the gross.

If he goes through 3 bottles of antacid every day, how long will the gross last?

A. 144 days

B. 3 days

C. 20 days

D. 48 days

ANSWER: D

Explanation:

48 days is correct because a gross is a standard counting unit equal to 12 dozen, and each dozen contains 12 items. Therefore, one gross of antacid bottles contains 12 × 12 = 144 bottles. The manager uses antacid at a constant rate of 3 bottles each day. To find the number of days the supply will last, divide the total number of bottles by the number used per day: 144 ÷ 3 = 48. Thus, the gross will provide enough bottles for 48 full days. This is a unit-rate calculation: the unit “bottles” cancels when total bottles are divided by bottles per day, leaving the answer expressed in days. The definition of a gross as 144 items is documented by Merriam-Webster; standard unit-conversion principles are also outlined by NIST.

QUESTION NO: 125

A 120V light bulb is rated for 40 watts.

What is the light bulb's current rating?

A. 3A

B. 1/3A

C. 2A

D. 1A

ANSWER: B

Explanation:

The correct current rating is **1/3A**, which is approximately 0.33 amperes. Electrical power is calculated by multiplying voltage by current: $P = V \times I$. Rearranging this relationship to solve for current gives $I = P \div V$. For this bulb, the rated power is 40 watts and the rated operating voltage is 120 volts, so the current is 40 W ÷ 120 V = 0.333... A. Thus, the bulb draws one-third of an ampere when operating at its rated 120-volt supply. This calculation uses the bulb’s rated operating values and expresses current in amperes, the standard unit for electrical current. The relationship among watts, volts, and amps is a

fundamental application of electric-power formulas used in electrical and electronics work. For a reference on calculating power and current in electric circuits, see All About Circuits: Ohm's Law and NIST: SI Units for Electricity and Magnetism.

QUESTION NO: 126

To bore holes into surfaces, a _____ is attached to a drill.

A. drill bit

B. fastener

C. screw

D. nail

ANSWER: A

Explanation:

A drill bit is the cutting tool attached to a drill for boring holes in materials such as wood, metal, plastic, or masonry. The drill's chuck grips the shank of the bit and rotates it; the bit's shaped cutting end removes material as it turns and advances into the surface. Different drill-bit designs are made for particular materials and hole types—for example, twist bits are widely used for general-purpose drilling, while masonry bits are designed for brick or concrete. Selecting a bit with the appropriate diameter determines the size of the hole, and selecting the appropriate bit material and tip design helps produce a clean, accurate hole without damaging either the workpiece or the tool. In basic shop terminology, "drill bit" specifically identifies the removable boring or cutting attachment used with a drill. The U.S. General Services Administration's hand-tool guidance describes drill bits as accessories used to create holes, and the Occupational Safety and Health Administration provides safety guidance for the use of portable power drills and their accessories. See GSA Hand Tools and OSHA: Hand-Held Power Tools—Drills.

QUESTION NO: 127

Abridge most nearly means _____.

A. native

B. shorten

C. travel

D. delirious

ANSWER: B

Explanation:

"shorten" is correct because *abridge* means to make a written work, speech, or other material shorter while retaining its essential content. An abridged version removes less important details, examples, or passages so that the central meaning can be presented in less space or time. For example, a long novel may be abridged for a younger audience, or an editor may abridge a lengthy report into a concise summary. The word is commonly used in publishing and writing contexts, where the goal is not simply to stop or reduce something, but specifically to condense content without losing its main ideas. Merriam-Webster defines *abridge* as shortening a work while retaining its essential features, and Cambridge Dictionary similarly describes it as making a book, play, or piece of writing shorter by removing details and less important parts. These definitions directly match "shorten." Merriam-Webster: abridge Cambridge Dictionary: abridge

QUESTION NO: 128

B Company ("Bulldogs"), 3rd Battalion, 144th Infantry, is authorized a total of 131 soldiers. However, Bulldog Company only has 125 total soldiers and officers assigned. Of those assigned, four percent are officers.

How many enlisted soldiers are assigned to the company?

A. 114

B. 123

C. 120

D. 121

ANSWER: C

Explanation:

The correct answer is **120**. The relevant total is the 125 personnel who are actually assigned to the company, rather than the authorized strength of 131. Since officers make up 4% of the assigned personnel, enlisted personnel make up the remaining 96%. Converting 96% to decimal form gives 0.96. Multiplying the assigned strength by this decimal produces the enlisted strength: 125 × 0.96 = 120. Equivalently, 4% of 125 is 5 officers, and subtracting those 5 officers from the 125 assigned personnel gives 120 enlisted soldiers. This result is an exact whole-person count because 125 is divisible in a way that makes 4% equal to 5. The question tests applying percentages to the stated population and then identifying the complementary percentage or subtracting the calculated officer count. For a review of converting percentages to decimals and calculating a percentage of a quantity, see Khan Academy's percentage review. The complementary-percent approach used here is also consistent with the general percentage principles described by Encyclopaedia Britannica.

QUESTION NO: 129

A wrench with fixed, open jaws is called a(n) _____.

A. adjustable wrench

B. Allen wrench

C. socket wrench

D. open-end wrench

ANSWER: D

Explanation:

An **open-end wrench** has a U-shaped opening, or jaw, at one or both ends that fits around the flats of a nut or bolt head. Its jaw dimensions are fixed: each end is made for a particular fastener size, rather than being adjusted to span different sizes. This design allows the wrench to engage a fastener from the side, which is especially useful when there is not enough clearance to place a closed tool over the end of a bolt or nut. Many open-end wrenches have different fixed sizes on their two ends, and some are combined with a box end on the opposite side; these are commonly called combination wrenches. Correct tool terminology matters in automotive and shop work because selecting the properly sized fixed jaw helps provide solid contact with the fastener flats and supports safe, effective torque application. The Encyclopaedia Britannica overview of wrenches describes open-end wrenches as having open jaws, while the OSHA hand-tool safety guide emphasizes using tools appropriately and safely.

QUESTION NO: 130

To prevent rapid drying, freshly cut logs are often _____.

A. submerged in oil

B. placed in kilns

C. submerged in water

D. placed in sheds to dry slowly

ANSWER: C

Explanation:

Freshly cut logs are often **submerged in water** to slow moisture loss before they are processed. Wood begins losing water after a tree is felled, and if the outer portions dry much faster than the interior, uneven shrinkage can create internal stresses. Those stresses can lead to checking, splitting, and other defects that reduce the value and usability of the lumber. Water storage, commonly called pond storage or wet storage, keeps the logs saturated and helps maintain a more uniform moisture condition until the mill is ready to saw them. This is particularly useful when logs must be stored for a period rather than converted into lumber immediately. By limiting exposure to air and sun, immersion reduces the rapid surface drying that causes end checks and cracks. The U.S. Forest Service's Wood Handbook discusses how drying and moisture movement affect wood properties and dimensional change: Wood Handbook: Wood as an Engineering Material. The Forest Products Laboratory also provides authoritative wood-science resources, including information on wood moisture and processing: USDA Forest Products Laboratory.

QUESTION NO: 131

Choose the answer to the following problem: 107 ÷ 104?

A. 10^3

B. 10^4

C. 10^7

D. 10^{11}

ANSWER: A

Explanation:

The correct answer is **10^3**. The expression is intended to represent 10^7 divided by 10^4. When dividing powers that have the same base, retain the common base and subtract the exponent in the denominator from the exponent in the numerator: $10^7 \div 10^4 = 10^{7-4} = 10^3$. This rule follows directly from expanding the powers: 10^7 contains seven factors of 10, while 10^4 contains four factors of 10. Four matching factors cancel during division, leaving three factors of 10 multiplied together. Therefore, the result is $10 \times 10 \times 10$, or 10^3, which equals 1,000. This is commonly called the quotient rule for exponents and is applicable whenever nonzero powers with the same base are divided. For additional review of exponent properties, see Khan Academy's exponent-properties review and OpenStax's discussion of exponent rules.

QUESTION NO: 132

When talking about nails, a 10d nail for example, the d stands for _____.

A. penny

B. pounds

C. inches

D. nail head size

ANSWER: A

Explanation:

In nail sizing, the “d” in “10d” stands for **penny**. This is the traditional penny-size designation used for common nails and several other nail types. The notation originated historically from the cost of one hundred nails in England: a certain size was associated with a particular number of pennies. Although that historical pricing system is no longer used to set nail prices, the “d” notation remains a standard way to identify nail size in construction and carpentry.

The penny designation corresponds generally to a nail’s length, so it helps builders select nails appropriate for the thickness and type of materials being fastened. For example, a 10d common nail is typically 3 inches long. The relationship is not simply that the number equals the length in inches; rather, penny sizes follow an established sizing chart. Modern building references and manufacturers continue to use penny designations alongside inch measurements. See the Federal Highway Administration’s wood construction guidance and American Wood Council wood design resources for construction fastening terminology and design context.

QUESTION NO: 133

If a car traveled 200 miles at an average rate of speed of r miles per hour, the time it took for the trip could be written as _____.

A. 200/r

B. r/200

C. 200r

D. r/60

ANSWER: A

Explanation:

The correct expression is **200/r**. Travel problems use the relationship distance = rate × time. Solving this relationship for time gives time = distance ÷ rate. Here, the distance traveled is 200 miles and the average speed is r miles per hour, so the trip time is 200 ÷ r, or 200/r hours.

The units confirm the expression: miles divided by miles per hour equals hours: 200 miles ÷ (r miles/hour) = 200/r hours. This is also logically consistent: for a fixed 200-mile trip, increasing the speed decreases the required time, while decreasing the speed increases the required time. For example, at 50 miles per hour, the expression becomes 200/50 = 4 hours.

This is an application of proportional reasoning and the standard rate formula used in ASVAB Arithmetic Reasoning questions. The formula and its rearrangement are described in OpenStax Elementary Algebra. For additional practice with distance, rate, and time relationships, see Khan Academy’s distance-rate-time lesson.

QUESTION NO: 134

Solve the following equation.

$y3 \times y4 =$ _____.

A. y^7

B. y^{12}

C. $2y^7$

D. $2y^{12}$

ANSWER: A

Explanation:

y^7 is correct because the expression represents y raised to the third power multiplied by y raised to the fourth power: $y^3 \times y^4$. When powers have the same base and are multiplied, the base remains y and the exponents are added. Therefore, 3 + 4 = 7, so the product is y^7. This exponent rule follows directly from repeated multiplication: y^3 is y × y × y, and y^4 is y × y × y × y. Together, there are seven factors of y, which is written compactly as y^7. This is commonly called the product-of-powers rule: $a^m \times a^n = a^{m+n}$, provided both factors have the same base. For additional practice with exponent properties, see OpenStax Elementary Algebra: Exponents and Khan Academy: Exponent properties review.

QUESTION NO: 135

Which of the following isn't a component of a DC motor?

A. rotor bars

B. armature

C. field poles

D. yoke

ANSWER: A

Explanation:

rotor bars is correct because rotor bars are the conductive bars embedded in the rotor of a squirrel-cage induction motor, which is an AC motor design. In that arrangement, the bars are typically aluminum or copper and are short-circuited at both ends by end rings. The stator's rotating magnetic field induces current in these bars, and the interaction of that induced rotor current with the stator field produces torque. This induction principle is the defining operating feature of a squirrel-cage AC induction motor.

A conventional DC motor instead uses a commutated armature circuit. Its rotating armature winding connects through a commutator and brushes, allowing the current in the armature conductors to be switched as the rotor turns so that torque continues in one direction. The motor's magnetic circuit includes stationary field poles and a yoke, while the armature is the rotating member carrying the windings. Therefore, "rotor bars" identifies a component associated with the squirrel-cage induction-motor rotor rather than the usual construction of a DC motor. For background on DC-machine construction and commutation, see Electrical4U: Construction of DC Machine. For an overview of squirrel-cage induction-motor rotors, see All About Circuits: Induction Motors.

QUESTION NO: 136

An important stage of personal time management is to take control of appointments. Determined by external obligation, appointments constitute interaction with other people and an agreed-on interface between your activities and those of others. Start with a simple appointment diary. List all appointments including regular and recurring ones. Now, be ruthless and eliminate the unnecessary. There may be committees where you can't productively contribute or where a subordinate may be able to participate. Eliminate the waste of your time.

Effectively managing your appointments allows you to _____.

A. spend more time with your subordinates

B. delegate responsibility to subordinates

C. make more efficient use of your time

D. attend only the most important meetings

ANSWER: C

Explanation:

The correct answer is **"make more efficient use of your time."** The passage describes a deliberate process for controlling appointments: recording all commitments, including recurring ones, reviewing them critically, and removing those that are unnecessary or unproductive. Its central instruction is to "eliminate the waste of your time." Removing avoidable commitments leaves more of a person's available time for meaningful work, necessary obligations, and high-priority activities. Therefore, the overall result of effectively managing appointments is more efficient use of time.

This is a paragraph-comprehension inference based on the author's main point rather than merely one example from the passage. The discussion of having a subordinate attend a committee is one possible way to reduce an unnecessary personal commitment, but the broader purpose is to manage the appointment schedule so time is not wasted. This reflects a core time-management practice: evaluating commitments against priorities and protecting time for activities that contribute productively to goals. For related time-management guidance, see the Mind Tools overview of time management and the CDC/NIOSH resources on work organization and time demands.

QUESTION NO: 137

What is the primary difference between distillation and evaporation?

A. Distillation separates components by vaporization and condensation, while evaporation is simply the change of a liquid to vapor.

B. One is intentional in scope, while the other occurs during other practices.

C. Distillation involves the use of implements, while evaporation only requires heat.

D. Distillation and evaporation have no primary difference; they are the same process.

ANSWER: A

Explanation:

Distillation separates or purifies liquids through a controlled sequence of vaporization and condensation. A liquid mixture is heated so that a component enters the vapor phase; that vapor is then cooled and collected as a liquid distillate. Because substances in a mixture commonly have different boiling points and vapor pressures, this process can isolate a component or produce a purified liquid. Evaporation, in contrast, is the phase change in which liquid molecules escape into the gas phase. It may occur at the surface of a liquid below its boiling point and does not, by itself, include collecting and condensing the vapor to obtain a separated product.

The key distinction is therefore the purpose and complete process: distillation uses evaporation plus condensation to separate or purify substances, whereas evaporation refers to the liquid-to-vapor change itself. This distinction is consistent with the definition of distillation provided by Encyclopaedia Britannica and with the phase-change description of evaporation in the U.S. Geological Survey Water Science School.

QUESTION NO: 138

Rebar is used to _____.

A. measure the depth of concrete

B. reinforce concrete

C. stir concrete

D. smooth concrete

ANSWER: B

Explanation:

Rebar is used to **reinforce concrete**. "Rebar" is short for reinforcing bar: a steel bar, usually with surface ribs, embedded in concrete as part of a reinforced-concrete structure. Concrete is very strong when it is compressed, making it well suited for carrying loads that push or squeeze it. However, structural members such as slabs, beams, walls, and footings can also

bend or experience pulling forces. Steel reinforcing bars supply tensile strength and help the concrete-and-steel assembly resist these forces safely. The ribs on typical rebar improve the bond between the steel and surrounding hardened concrete so the materials act together under load. Rebar is positioned according to an engineered design before concrete is placed, allowing the finished component to carry intended loads while limiting cracking and maintaining structural performance. The Federal Highway Administration describes reinforcing steel as an integral part of concrete construction and addresses its role in reinforced concrete structures. The Concrete Reinforcing Steel Institute also identifies reinforcing bars as steel products used to reinforce concrete. See the Federal Highway Administration's reinforced-concrete guidance and the Concrete Reinforcing Steel Institute.

QUESTION NO: 139

A digital video recorder is programmed to record a TV show that lasts for a half hour.

If the digital video recorder has enough memory left to hold 180 minutes of recording, what percentage of the remaining capacity is used for this recording?

A. 162/3%

B. 30%

C. 60%

D. 331/3%

ANSWER: A

Explanation:

The correct answer is **162/3%**, meaning 16 2/3%. A half-hour recording occupies 30 minutes of storage capacity. The recorder has 180 minutes of remaining capacity, so the fraction of that capacity used by the program is calculated as 30 divided by 180. Simplifying the fraction gives 1/6. To express a fraction as a percentage, multiply it by 100: (1/6) × 100 = 100/6 = 16 2/3%. Therefore, recording the 30-minute show uses one-sixth of the remaining 180-minute capacity, which is 16 2/3 percent. This type of problem follows the standard percent relationship: part ÷ whole × 100. Here, the part is the program length in minutes and the whole is the available recording time in minutes. Both quantities use the same unit, so they can be compared directly. For more information on converting fractions to percentages, see Khan Academy's guide to converting fractions and Math Is Fun's percentage overview.

QUESTION NO: 140

Arcanum most nearly means _____.

A. rare

B. secret

C. tangible

D. false

ANSWER: B

Explanation:

secret is correct because *arcanum* means a mystery, secret, or piece of specialized knowledge known only to a limited group. The word comes from the Latin *arcanus*, meaning hidden or secret. In ordinary usage, an arcanum may be confidential information or an obscure principle that is not generally understood. For an ASVAB Word Knowledge question, the best strategy is to select the answer that matches the word's central dictionary definition rather than one that merely has a loosely related idea. "Secret" directly expresses the defining meaning of *arcanum*. Merriam-Webster defines *arcanum* as "a secret mystery" or "obscure knowledge," and Dictionary.com similarly identifies it as a secret or mystery. These definitions

support “secret” as the closest available synonym. See Merriam-Webster’s definition of arcanum and Dictionary.com’s definition of arcanum.

QUESTION NO: 141

Susceptible most nearly means _____.

A. travel

B. resistant

C. limited

D. gullible

ANSWER: D

Explanation:

“Gullible” is the best answer because *susceptible* means readily affected, influenced, harmed, or persuaded by something. When describing a person, it can mean that the person is easily influenced or easily persuaded to believe something, which closely matches being gullible. For example, someone susceptible to misleading claims may be inclined to accept those claims without enough skepticism. The word can also be used outside of social influence, as in being susceptible to an illness, injury, or environmental effect; in each use, the central idea is a particular openness or vulnerability to an outside influence. In this question’s vocabulary context, “gullible” most nearly captures the sense of being easily influenced or deceived. Merriam-Webster defines susceptible as “easily affected, influenced, or harmed by something,” and its learner-oriented definition includes being easily affected or influenced. See Merriam-Webster: susceptible and Cambridge Dictionary: susceptible.

QUESTION NO: 142

When finishing a piece of wood, it’s best to sand _____.

A. diagonal to the grain

B. against the grain

C. with the grain

D. in small circles

ANSWER: C

Explanation:

When finishing a piece of wood, it is best to sand **with the grain**. Wood is made of long fibers that run in the direction of its grain. Moving the abrasive in that same direction helps blend the tiny sanding marks into the natural texture of the wood, producing a smoother-looking surface and preparing it to accept stain, paint, or a clear finish more evenly. This is particularly important during final sanding, when finer grits are used and visible scratches can remain noticeable after a finish is applied.

A practical approach is to identify the direction of the wood fibers, sand along that direction using progressively finer sandpaper as needed, and remove all sanding dust before applying the chosen finish. Sanding in line with the grain supports an even, professional-looking result because the surface texture follows the wood’s natural pattern. The U.S. Forest Products Laboratory’s Wood Handbook chapter on finishing discusses surface preparation and finishing considerations. Additional woodworking guidance is available from WOOD Magazine’s wood-grain guide.

QUESTION NO: 143

The word most opposite in meaning to benison is _____.

A. theft

B. replaceable

C. curse

D. heavy

ANSWER: C

Explanation:

Curse is the correct answer because a *benison* is a blessing, benefit, or expression of good wishes. The word is an older literary term derived from a Latin root associated with speaking well. In common use, a blessing conveys favor, protection, or hoped-for good outcomes. A curse expresses the directly opposing idea: it is an invocation or wish for harm, misfortune, or suffering. Therefore, when identifying the word most opposite in meaning, *curse* provides the clearest and most exact antonym for *benison*.

Recognizing related vocabulary can make this relationship easier to remember. *Benison* is closely associated with *blessing*, while *curse* is its conventional semantic opposite in both everyday and literary language. Dictionary definitions explicitly identify *benison* as a blessing or benefit, supporting this antonym relationship. See the definitions in Merriam-Webster's entry for benison and Dictionary.com's entry for benison.

QUESTION NO: 144

The half-life of iodine-131 is 8 days.

Approximately how long would it take for 1 milligram of 1-131 to decay to 1/2 milligram of 1-131?

A. 4 days

B. 8 days

C. 2 weeks

D. 1 month

ANSWER: B

Explanation:

The correct answer is **8 days**. A radioactive isotope's half-life is the time required for one-half of the radioactive nuclei in a sample to decay. The sample begins with 1 milligram of iodine-131, and the target amount is 1/2 milligram. Because 1/2 milligram is exactly half of 1 milligram, only one half-life must pass. Since the stated half-life is 8 days, the sample will be reduced to approximately 1/2 milligram after 8 days.

Radioactive decay is statistical: individual iodine-131 atoms do not all decay at the same moment. However, for a sufficiently large sample, the half-life reliably describes the expected reduction in the total amount. After one 8-day interval, the expected remaining quantity is 1 mg × 1/2 = 0.5 mg. This reasoning uses the standard half-life relationship, in which the remaining amount after one half-life is one-half of the initial amount. The U.S. Nuclear Regulatory Commission identifies iodine-131 as having an approximately 8-day half-life: NRC: Radioactive Iodine Therapy. General information on radioactive decay and half-life is also provided by the International Atomic Energy Agency: IAEA: Radiation Protection.

QUESTION NO: 145

You are hosting a graduation party and you need 32 gallons of lemonade.

Which is the best buy?

A. three 10-gallon jugs at $208 each + two 1-gallon jugs at $15 each

B. one 25-gallon jug at $542 + one 5-gallon jug at $100 + two 1-gallon jugs at $15 each

C. one 25-gallon jug at $542 + one 10-gallon jug at $208

D. six 5-gallon jugs at $100 each + two 1-gallon jugs at $15 each

ANSWER: D

Explanation:

The best buy is **six 5-gallon jugs at $100 each + two 1-gallon jugs at $15 each**. This combination supplies exactly the required 32 gallons: six 5-gallon jugs provide 30 gallons, and two additional 1-gallon jugs provide the remaining 2 gallons. The total cost is found by multiplying each jug quantity by its price and then adding the results: 6 × $100 = $600, and 2 × $15 = $30, for a total of $630.

For a best-buy comparison, each combination must first be checked to ensure it provides at least the required amount, then its complete purchase price must be calculated. Buying the exact needed quantity is especially useful here because it avoids paying for unnecessary extra lemonade. The $630 total is the lowest total purchase cost among the listed combinations that meet the 32-gallon need. This applies the standard arithmetic process of evaluating expressions using multiplication before addition, as reviewed by Khan Academy's order-of-operations guidance. Comparing the cost required to obtain a specified quantity is also an example of ratio and rate reasoning; see OpenStax Prealgebra on ratios and rates.

QUESTION NO: 146

Which wire is smallest?

A. 00 AWG

B. 4 AWG

C. 10 AWG

D. 12 AWG

ANSWER: D

Explanation:

12 AWG is the smallest wire listed because American Wire Gauge uses an inverse numbering system: as the AWG number increases, the conductor's physical diameter and cross-sectional area decrease. Therefore, a 12 AWG conductor has a smaller diameter than the other listed gauge sizes. This convention applies to standard solid round electrical conductors and is widely used to identify wire size in electrical and automotive applications. The "00" designation is also called 2/0 AWG; the zero and "aught" sizes are larger conductors used where high current capacity is needed. Wire size matters because conductor diameter affects resistance, current-carrying capability, voltage drop, weight, and flexibility. A smaller-diameter conductor such as 12 AWG has more electrical resistance per unit length than a larger-diameter conductor. Manufacturer reference tables show the standard AWG diameters and areas, including 12 AWG, and illustrate the inverse relationship between gauge number and conductor size. See Cerro Wire's wire ampacity and sizing resources and the American Wire Gauge reference for standard gauge-size information.

QUESTION NO: 147

Pardon most nearly means _____.

A. courtesy

B. excuse

C. believe

D. respect

ANSWER: B

Explanation:

"Excuse" is correct because *pardon* commonly means to forgive someone for an offense or to excuse a fault, mistake, or interruption. For example, a person may say, "Please pardon my lateness," meaning "Please excuse my lateness." In a legal context, a pardon is official forgiveness for a crime, but the central idea remains forgiveness or excusing someone from blame or penalty. As a verb, *excuse* closely matches this meaning: it can mean to forgive a minor offense, overlook a mistake, or release someone from an obligation. This is the closest synonym among the choices and reflects the everyday vocabulary relationship tested in ASVAB Word Knowledge questions. Dictionary definitions support this connection: Merriam-Webster defines *pardon* as excusing or forgiving a fault or offense, while Cambridge Dictionary includes forgiving someone for something they have said or done. See Merriam-Webster's definition of "pardon" and Cambridge Dictionary's definition of "pardon".

QUESTION NO: 148

What number multiplied by 2/3 will give a product of 1?

A. −2/3

B. −3/2

C. 3/2

D. 4/6

ANSWER: C

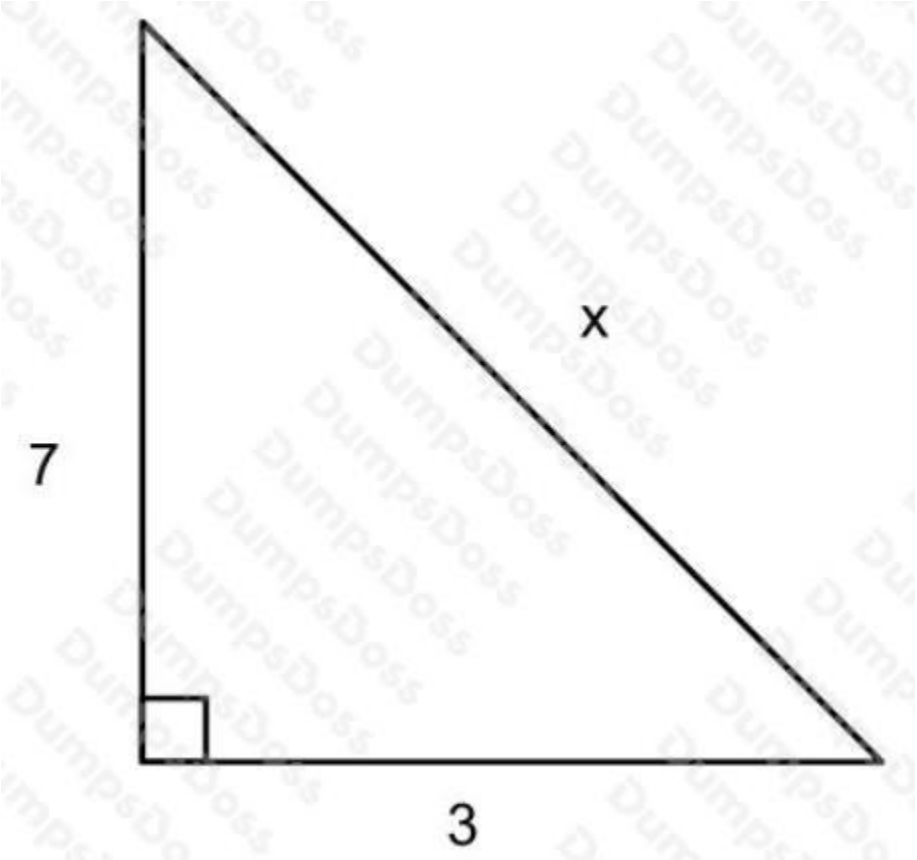
Explanation:

The correct answer is **3/2**. A number that produces 1 when multiplied by a nonzero fraction is called that fraction's reciprocal, or multiplicative inverse. To find the reciprocal of a fraction, interchange its numerator and denominator. Therefore, the reciprocal of 2/3 is 3/2.

This can be verified directly: (2/3) × (3/2) = (2 × 3)/(3 × 2) = 6/6 = 1. The numerator and denominator contain the same nonzero factors, so the result simplifies exactly to 1. This reciprocal relationship is a core fraction rule and is also the basis for division by fractions: dividing by a fraction is equivalent to multiplying by its reciprocal. For example, if x × 2/3 = 1, multiplying by 3/2 isolates x, giving x = 3/2.

For additional review of multiplying fractions and reciprocal relationships, see Khan Academy's multiplying fractions lesson and OpenStax Prealgebra on multiplication and division.

QUESTION NO: 149



In the diagram provided, what is x?

A. 10.2893644

B. 2.333333333

C. 7.61577310586

D. 21.23947643

ANSWER: C

Explanation:

The value of **x** is **7.61577310586**. The diagram's relevant measurements form a right triangle with perpendicular side lengths of 3 and 7. For a right triangle, the Pythagorean theorem states that the square of the hypotenuse equals the sum of the squares of the two legs: $x^2 = 3^2 + 7^2$. Substituting the measurements gives $x^2 = 9 + 49 = 58$. Taking the positive square root, because a geometric length cannot be negative, gives $x = \sqrt{58}$. The decimal approximation of $\sqrt{58}$ is 7.61577310586, which is the stated value. This is a direct application of the Pythagorean theorem, used whenever two sides meet at a right angle and the unknown is the side opposite that angle. For a review of the theorem and its use in finding an unknown side length, see Khan Academy's Pythagorean theorem overview and OpenStax's explanation of the Pythagorean theorem.

QUESTION NO: 150

Mrs. H.B. found a display model of a notebook computer to use for her business for $1,400, including software. However, since the model had been discontinued and the display had no packaging material or instructions, the store manager discounted the price to $1,150.

What was the percentage of the reduction?

A. 1.78%

B. 13.0%

C. 15.0%

D. 17.9%

ANSWER: D

Explanation:

The reduction is found by subtracting the sale price from the original price: $1,400 − $1,150 = $250. A percentage reduction must be measured against the original price, so divide the discount amount by $1,400: $250 ÷ $1,400 = 0.178571.... Converting this decimal to a percentage by multiplying by 100 gives 17.8571...%. Rounded to the nearest tenth of a percent, the percentage reduction is 17.9%. This uses the standard percent-change relationship: (amount of decrease ÷ original amount) × 100. For additional practice with calculating percent decrease, see Khan Academy's percent increase and decrease lesson. The calculation is also consistent with the general definition of a percentage as a ratio expressed per hundred, described by Encyclopaedia Britannica.

QUESTION NO: 151

Although carjacking has become more common in the past 10 years, there are several preventative measures that drivers can take. The first way to prevent carjacking is to never walk alone to your car at night. Another means of prevention is always driving with the windows rolled up and the doors locked. Also, driving on well-lit and often traveled roads is another preventative measure that drivers can take to ensure their safety from carjacking.

The author probably believes that _____.

A. carjacking never happens during the day

B. carjacking can often be avoided by employing simple preventive measures

C. it is almost impossible to avoid carjacking

D. carjacking only happen at night.

ANSWER: B

Explanation:

The author probably believes that carjacking can often be avoided by employing simple preventive measures. The passage's central point is that, even though carjacking is described as increasingly common, drivers can reduce their risk through practical safety habits. The author supports this view by identifying specific actions: avoiding walking alone to a vehicle at night, keeping vehicle doors locked and windows closed while driving, and choosing well-lit, frequently traveled roads. These details show a belief that personal precautions can make drivers less vulnerable and improve their safety.

This is an inference question: the answer is not stated in exactly those words, but it is strongly supported by the repeated focus on prevention. The word "preventative" and the statement that these practices can "ensure" safety communicate that the author sees such measures as useful and meaningful rather than futile. This general safety approach is also consistent with crime-prevention guidance from law-enforcement agencies, which recommends situational awareness and secured vehicles to reduce opportunities for vehicle-related crimes. See the National Highway Traffic Safety Administration's vehicle-theft prevention guidance and the USA.gov safety and crime-prevention resources.

QUESTION NO: 152

The term for a pair of pliers made specifically for cutting wires is _____.

A. long-nose pliers

B. vice grip pliers

C. slip-joint pliers

D. cutting pliers

ANSWER: D

Explanation:

Cutting pliers are specifically designed to sever wire. Their defining feature is a pair of hardened, sharpened cutting edges at the jaws; when the handles are squeezed, the jaws apply concentrated force that cuts through electrical wire, small metal wire, and similar materials. This tool category includes common forms such as diagonal-cutting pliers and end-cutting pliers, but the general term requested by the question is *cutting pliers*. Selecting the appropriate cutter helps produce a clean cut while avoiding damage to the tool or injury from flying wire ends. Tool manufacturers describe cutting pliers as tools intended for cutting wire and other small materials; see the Knipex cutting pliers product category. For additional general tool-safety guidance, including using hand tools only for their intended purpose and wearing proper eye protection, consult OSHA's hand and portable powered tools standard.

QUESTION NO: 153

The fourth root of 16 is _____.

A. 4

B. 1

C. 3

D. 2

ANSWER: D

Explanation:

The fourth root of 16 is **2**. A fourth root is a number that, when multiplied by itself four times, produces the original number. Starting with 2, calculate 2 × 2 × 2 × 2: first, 2 × 2 = 4; then 4 × 2 = 8; and finally 8 × 2 = 16. Equivalently, this is written as $2^4 = 16$. Therefore, the principal fourth root, written as $\sqrt[4]{16}$, equals 2.

On the ASVAB Mathematics Knowledge test, roots and exponents are inverse operations. Recognizing common perfect powers makes these questions faster: 16 is a perfect fourth power because it can be expressed as 2^4. Although −2 also has a fourth power of 16, radical notation asks for the principal, nonnegative root, so the value of the fourth-root expression is 2. For additional review of exponents and roots, see Khan Academy: Exponents and radicals and OpenStax: Simplify and use roots.

QUESTION NO: 154

The word fragility most nearly means _____.

A. elasticity

B. firmness

C. sturdiness

D. delicacy

ANSWER: D

Explanation:

"Delicacy" is correct because *fragility* describes the quality of being easily broken, damaged, or harmed. Something fragile requires careful handling because it lacks resistance to force or pressure. Likewise, delicacy can describe a state of being fine, sensitive, or easily damaged—for example, the delicacy of glassware or a delicate mechanical component. In vocabulary questions, the best answer is the one that preserves the central meaning of the word in ordinary usage. Here,

both terms convey vulnerability to breakage or injury and a need for gentleness or care. Merriam-Webster defines *fragility* as the quality or state of being fragile, while its definition of *fragile* includes being easily broken or damaged. See Merriam-Webster: fragility. Cambridge Dictionary similarly defines *delicacy* as the quality of being delicate, including being easily damaged or needing careful treatment; see Cambridge Dictionary: delicacy. Therefore, “delicacy” is the closest synonym for “fragility.”

QUESTION NO: 155

My voice is strident.

A. soft

B. melodious

C. harsh

D. baritone

ANSWER: C

Explanation:

“harsh” is correct because *strident* describes a sound, especially a voice, that is loud, forceful, and unpleasantly sharp or grating. In the sentence, saying that a voice is strident communicates that its quality is abrasive rather than gentle or soothing. “Harsh” is the closest synonym because it likewise describes an unpleasantly rough, severe, or piercing sound. This is a word-knowledge question, so the key is to identify the meaning of the tested word from its standard usage and choose the option with the most equivalent meaning. Major dictionaries define *strident* as having a loud, harsh, and grating quality, particularly when referring to a voice or other sound. See the Merriam-Webster definition of “strident” and the Cambridge Dictionary entry for “strident”. Thus, “My voice is strident” means that the speaker’s voice is harsh.

QUESTION NO: 156

What voltage will cause an 8 Amp current to flow through a 24 ohm resistor?

A. 3 volts

B. 192 volts

C. 1/3 volt

D. 32 volts

ANSWER: B

Explanation:

The correct answer is **192 volts**. Ohm’s law defines the relationship among voltage, current, and resistance: voltage equals current multiplied by resistance, written as $V = I \times R$. The stated current is 8 amperes and the resistance is 24 ohms. Substituting those values gives $V = 8\ A \times 24\ \Omega = 192\ V$. Therefore, a potential difference of 192 volts across the resistor is required to drive 8 amperes of current through it, assuming the resistor’s value remains 24 ohms. The units also confirm the result: an ampere multiplied by an ohm equals a volt. This basic calculation is central to electrical troubleshooting and circuit analysis because it allows a technician to determine the required supply voltage when the desired current and circuit resistance are known. For a reference on Ohm’s law and the relation among volts, amps, and ohms, see All About Circuits: Ohm’s Law and NIST: SI Units for Electricity and Magnetism.

QUESTION NO: 157

Which is considered the left side of an engine?

A. The left side when you stand feeing the car in front.

B. The side that the starter motor is on.

C. Depends on the manufacturer.

D. The left side when you sit in the driver's seat and face forward.

ANSWER: D

Explanation:

The left side of an engine is identified from the perspective of a person seated in the vehicle's driver's seat and facing forward—the same orientation used to identify the vehicle's left and right sides. Therefore, "The left side when you sit in the driver's seat and face forward." is correct. This convention provides a consistent reference point for vehicle service information, parts catalogs, repair manuals, and communications between technicians. It remains the standard even when looking at the engine from the front of the vehicle, where the apparent sides will be visually reversed relative to the driver's perspective. Engine position, drivetrain layout, and the locations of individual components do not change the directional naming convention. Standard automotive terminology uses the vehicle's forward direction and occupant perspective to establish left/right orientation. For related automotive terminology and training resources, see the National Institute for Automotive Service Excellence certification information and the National Highway Traffic Safety Administration vehicle-safety resources.

QUESTION NO: 158

Jack loaned Bob $1,500 at an annual interest rate of 7%.

After one year, how much will Bob owe Jack?

A. $105

B. $1,500

C. $1,605

D. $1,507

ANSWER: C

Explanation:

The correct answer is **$1,605**. An annual interest rate of 7% means that, over one year, the interest charged is 7% of the original loan amount. Convert 7% to decimal form, 0.07, and multiply it by the $1,500 principal: $1,500 × 0.07 = $105 in interest. Bob's total amount owed after one year is the original $1,500 loan plus the $105 interest: $1,500 + $105 = $1,605. This problem uses simple interest for one year because it gives a principal amount and one annual rate without stating that interest is compounded. The general simple-interest formula is I = P × r × t, where P is the principal, r is the annual rate expressed as a decimal, and t is time in years. Here, I = $1,500 × 0.07 × 1 = $105. Adding that interest to the principal produces the final balance of $1,605. For an overview of calculating simple interest, see Consumer Financial Protection Bureau: What is simple interest? and Khan Academy: Percent word problems.

QUESTION NO: 159

How many different elements are present in glucose, C6H12O6?

A. 1

B. 3

C. 5

D. 7

ANSWER: B

Explanation:

3 is correct because the chemical formula for glucose, $C_6H_{12}O_6$, contains three distinct element symbols: C for carbon, H for hydrogen, and O for oxygen. The small numbers written after those symbols are subscripts. They specify the number of atoms of each element in one molecule of glucose: six carbon atoms, twelve hydrogen atoms, and six oxygen atoms. Subscripts do not indicate additional types of elements; they only give the quantity of atoms for the element symbol immediately before them. Therefore, although one glucose molecule contains 24 atoms in total, it is made from only three different elements. This use of chemical symbols and subscripts is the standard convention for interpreting molecular formulas. The IUPAC Gold Book definition of a molecular formula describes a molecular formula as expressing the composition of a substance through element symbols and numerical subscripts. The Encyclopaedia Britannica entry on glucose likewise identifies glucose as $C_6H_{12}O_6$, confirming that its constituent elements are carbon, hydrogen, and oxygen.

QUESTION NO: 160

The smallest part of an element that still acts like an element is _____.

A. the nucleus

B. a compound

C. the element itself

D. the atom

ANSWER: D

Explanation:

The atom is the smallest unit of an element that retains that element's chemical identity and characteristic properties. Every atom of a particular element has the same number of protons in its nucleus, known as its atomic number. For example, every oxygen atom contains eight protons, which is what makes it oxygen. An atom can participate in chemical reactions, bond with other atoms, and exist as a neutral particle or as an ion while still being identifiable as the same element. Atoms contain a central nucleus made of protons and neutrons, with electrons occupying the space around the nucleus. Although the nucleus is an essential component of an atom, it is not by itself the smallest unit that behaves chemically as the whole element. The concept of the atom is foundational to chemistry because elements are defined by their atoms and the proton count within them. The National Institute of Standards and Technology describes atoms as the basic units of matter, and the Royal Society of Chemistry explains that an element consists of only one type of atom. See NIST's overview of mass and atomic-scale measurement and the Royal Society of Chemistry periodic table.

QUESTION NO: 161

The brainstem connects the brain to the _____.

A. heart

B. lungs

C. neck

D. spinal cord

ANSWER: D

Explanation:

The correct completion is **spinal cord**. The brainstem is the lower portion of the brain and serves as the direct anatomical connection between the brain and spinal cord. It includes the midbrain, pons, and medulla oblongata. Through this connection, nerve signals can travel between the brain and the rest of the body via the spinal cord. The brainstem also

contains pathways and control centers essential for automatic functions that sustain life, including breathing, heart-rate regulation, blood-pressure control, swallowing, and sleep-wake activity. Its location at the base of the brain, continuing downward into the spinal cord, makes it a critical communication link within the central nervous system. This basic relationship is commonly tested in ASVAB general science questions: the brain processes and coordinates information, while the spinal cord carries signals to and from the body, with the brainstem joining these structures. For an anatomical overview, see the National Center for Biotechnology Information's description of the brainstem and the Encyclopaedia Britannica brainstem reference.

QUESTION NO: 162

A street vendor sells $25.70 worth of pretzels on Friday, $32.30 on Saturday, and $31.80 on Sunday. He spends a fourth of the money over the weekend.

How much money does he have left?

A. $89.80

B. $22.45

C. $44.90

D. $67.35

ANSWER: D

Explanation:

The correct answer is **$67.35**. First, combine the vendor's sales for all three days: $25.70 + $32.30 + $31.80 = $89.80. The phrase "spends a fourth" means he uses one-fourth of the total amount, so the amount remaining is three-fourths of the total. This can be found by multiplying $89.80 by 3/4: $89.80 ÷ 4 = $22.45, and $22.45 × 3 = $67.35. Equivalently, subtract the one-fourth spent from the total: $89.80 − $22.45 = $67.35. Therefore, after spending one-fourth of his weekend sales money, the vendor has $67.35 left. This uses the standard fraction principle that if one of four equal parts is removed, three of the four equal parts remain. For a review of multiplying a quantity by a fraction, see Khan Academy: Multiplying fractions. The ASVAB Arithmetic Reasoning subtest includes practical word problems involving arithmetic operations and fractions; see the official ASVAB subtests overview.

QUESTION NO: 163

Attendents were stationed at intervals, with the obvious intent to hector those who moved too slowly.

A. hurry

B. harass

C. encourage

D. note

ANSWER: B

Explanation:

"harass" is correct because *hector* means to intimidate, bully, or trouble someone with persistent verbal pressure. In the sentence, attendants are positioned at intervals specifically to confront people who are moving slowly. That context indicates they are not merely observing or providing neutral direction; their intended behavior is to pressure and badger those people. "Harass" accurately captures this hostile, pestering sense of the word.

The verb *hector* is commonly used when someone speaks or acts in an overbearing, bullying, or aggressively critical manner toward another person. It can describe repeated scolding or nagging designed to make someone act differently. The sentence's phrase "obvious intent" reinforces that the attendants' purpose was to impose this kind of unwelcome pressure on slow-moving individuals. Major dictionaries define *hector* in terms of bullying, intimidating, or harassing behavior, supporting

"harass" as the closest synonym in this context. See the Merriam-Webster definition of hector and the Cambridge Dictionary entry for hector.

QUESTION NO: 164

Apparently, two sheriffs in the state of New York are finding fault with Governor Cuomo's recent gun control efforts. The men have gone so far as to state that they will not enforce gun law packages Cuomo has recently signed into law. Public statements to this effect have been made by the two law enforcement officials and Cuomo warned that the precedent they set could be dangerous. The officers' intent does not appear to signify a new practice, however, as records show a general lack of enforcement of felony gun laws among sheriffs since 2010. State and local police have been the ones to file the majority of common gun-related charges (98%) during that time.

Based on the above passage, the reader can conclude that _____.

A. Gov. Cuomo is unaffected by the sheriff reaction to the new gun laws

B. sheriffs are not going to be the primary group to file felony gun charges

C. state and local police do not agree with the new gun laws in New York

D. Gov. Cuomo is going to take legal action against officers who do not comply with new laws

ANSWER: B

Explanation:

The conclusion that sheriffs are not going to be the primary group to file felony gun charges follows directly from the passage's stated enforcement pattern. Although the passage begins with two sheriffs publicly saying they will not enforce recently enacted gun-law provisions, it then supplies broader historical context: sheriffs have generally shown limited enforcement of felony gun laws since 2010. Most importantly, it quantifies which agencies have actually brought common gun-related charges during that period: state and local police filed 98 percent of them. That overwhelming share supports a careful inference about the likely primary filing agencies. The passage does not require the reader to predict every sheriff's future conduct; rather, it establishes that sheriffs have not been the principal source of such charges and that state and local police have carried that role. This is an example of drawing a conclusion from explicit statistical evidence and an identified trend, a key paragraph-comprehension skill. New York's public-safety reporting provides context on criminal-justice data collection and reporting at the New York State Division of Criminal Justice Services, while the state's firearm-law information is available through the New York State Gun Safety portal.

QUESTION NO: 165

Gerry Marpus is 78 years old and needs to use a cane for balance when walking. Many of her friends have given up driving and rely on their families to take them around town. Gerry, however, maintains that she is perfectly capable of driving herself. Knowing that her children were concerned about this, she decided to take advantage of a senior citizen driving course at the local community center. When she presented her completion certificate to her daughter and son, she could see the relief in their eyes and she knew she had done the right thing.

From the above passage, the reader can infer that Gerry _____.

A. wanted the people at the community center to decide if she could drive because she was afraid

B. wants to disregard whatever her children think and do what she wants to do

C. cares about her children's concerns and is an independent thinker

D. wants to be labeled disabled so she can get further treatments for balance issues

ANSWER: C

Explanation:

The best inference is that Gerry **cares about her children's concerns and is an independent thinker**. She initially maintains that she is capable of driving herself, showing that she makes her own judgment rather than automatically following the choices made by her friends. At the same time, she recognizes that her children are worried about her safety. Instead of dismissing that concern, she voluntarily takes a senior driving course and shares the completion certificate with them. Their visible relief and Gerry's sense that she "had done the right thing" show that their feelings mattered to her. This conclusion is an inference because the passage demonstrates these traits through Gerry's actions rather than directly naming them. Strong paragraph-comprehension answers are supported by specific details in the text and combine those details into a reasonable conclusion, without introducing assumptions that the passage does not provide. The ASVAB includes Paragraph Comprehension questions that assess the ability to obtain information and draw meaning from written material; see the official ASVAB assessment overview. For additional guidance on identifying stated ideas and supported inferences in reading passages, see Khan Academy's reading-skills resources.

QUESTION NO: 166

The gold was kept in a secure vault.

A. locked

B. safe

C. unknown

D. thick

ANSWER: B

Explanation:

"safe" is correct because, in this sentence, "secure" means protected from danger, loss, theft, or unauthorized access. A vault is specifically designed to safeguard valuable items, and saying that gold was kept in a secure vault emphasizes that the gold was in a safe, protected place. The sentence's context supplies the intended meaning: gold is valuable, a vault is a protective storage location, and "secure" describes the level of protection provided. Therefore, "safe" is the closest synonym that preserves the meaning of the sentence without changing its tone or grammar.

Word-knowledge questions commonly require using context to select the word with the nearest meaning, rather than relying only on a memorized definition. Here, the noun "vault" strongly signals physical protection and controlled access, which confirms that "secure" is being used in the sense of safe or safeguarded. Standard dictionary definitions similarly define "secure" as free from danger or protected against threat. See the Merriam-Webster definition of secure and the Cambridge Dictionary definition of secure.

QUESTION NO: 167

If you divide 24x3 + 16x2 − 8x by 8x, how many x's will be there in the quotient?

A. 0

B. 5

C. 2

D. −1

ANSWER: C

Explanation:

The correct answer is **2**. Treat the stated powers as exponents: the expression is $24x^3 + 16x^2 - 8x$, divided by $8x$. Divide each term in the numerator by the monomial denominator. The numerical coefficients divide to give 3, 2, and −1. For the variable factors, apply the quotient rule for exponents: when dividing like bases, subtract the exponent in the divisor from the exponent in the dividend. Thus, $x^3 \div x = x^2$, $x^2 \div x = x$, and $x \div x = 1$. The resulting quotient is $3x^2 + 2x - 1$.

The question asks how many terms in that quotient contain an x. The terms $3x^2$ and $2x$ each contain the variable, while the constant term −1 does not. Therefore, there are 2 x-containing terms in the quotient. This use of exponent rules and term-by-term division is consistent with standard polynomial-division procedures; see OpenStax Elementary Algebra and Khan Academy's exponent-division lesson.

QUESTION NO: 168

An employee of a chocolate factory earns $7.20 an hour. She is paid time and a half for overtime beyond a 40-hour week.

How much will she earn in a week in which she works 43 hours?

A. $295.20

B. $320.40

C. $432.00

D. $464.40

ANSWER: B

Explanation:

The correct total is **$320.40**. The employee receives her standard hourly rate for the first 40 hours: $7.20 multiplied by 40 equals $288.00. Because she works 43 hours, she has 3 overtime hours beyond the 40-hour threshold. "Time and a half" means the overtime hourly rate is 1.5 times the regular rate, so $7.20 multiplied by 1.5 equals $10.80 per overtime hour. Her overtime earnings are therefore 3 multiplied by $10.80, or $32.40. Adding the regular earnings of $288.00 and the overtime earnings of $32.40 gives total weekly pay of $320.40. This calculation follows the standard overtime approach of separately computing regular-time wages and premium overtime wages. The U.S. Department of Labor explains that, under the Fair Labor Standards Act, covered nonexempt employees generally receive overtime pay at no less than one and one-half times their regular rate for qualifying overtime hours: U.S. Department of Labor overtime guidance. For additional practice with percent and rate calculations used in ASVAB arithmetic reasoning, see the official ASVAB program information at Official ASVAB.

QUESTION NO: 169

To cause a current of 10 amperes to flow through 20-ohm resistance, the voltage needed is _____.

A. 20 volts

B. 1 volt

C. 10 volts

D. 200 volts

ANSWER: D

Explanation:

The correct answer is **200 volts**. The relationship among voltage, current, and resistance is given by Ohm's law: voltage equals current multiplied by resistance, written as $V = I \times R$. Here, the required current is 10 amperes and the resistance is 20 ohms. Substituting those values gives $V = 10\ A \times 20\ \Omega = 200\ V$. Therefore, a potential difference of 200 volts is needed to drive 10 amperes through a 20-ohm resistance, assuming the resistance remains constant. The units also confirm the result: an ampere multiplied by an ohm equals a volt. This is a fundamental direct-current circuit calculation and is commonly used to determine the voltage source required for a specified current through a known load. For an authoritative overview of Ohm's law and the meanings of volts, amperes, and ohms, see NIST's SI Units for Electricity and Magnetism and All About Circuits: Ohm's Law.

QUESTION NO: 170

You just left for vacation 2 hours ago. You have driven about 50 miles per hour on the 2-lane road and take an exit to get dinner. You call your Dad to check in. Your Dad has decided to join you after initially turning down your invitation.

How long will you have to wait for him if he drives 40 miles per hour?

A. 2 hours + 30 minutes

B. 2 hours + 40 minutes

C. 3 hours

D. 2 hours + 20 minutes

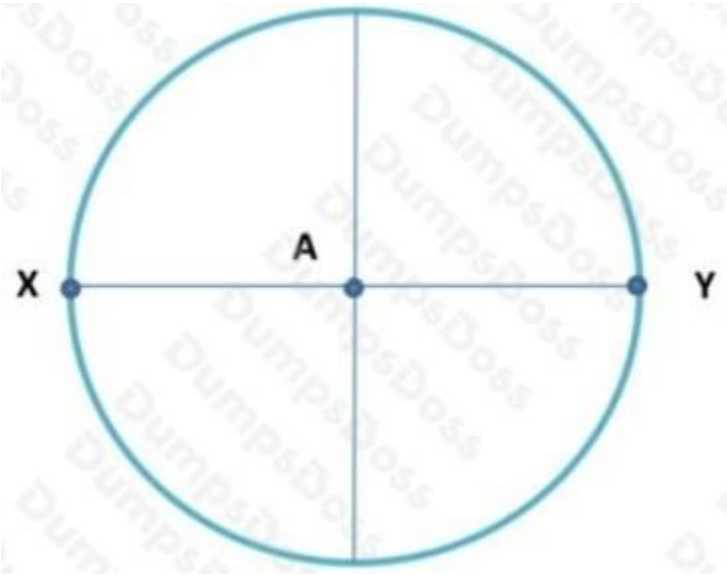
ANSWER: A

Explanation:

The correct answer is **2 hours + 30 minutes**. Before stopping for dinner, you traveled for 2 hours at approximately 50 miles per hour. Distance is found by multiplying rate by time: 50 miles per hour × 2 hours = 100 miles. Therefore, when you call, you are about 100 miles ahead of where your dad begins his trip.

Your dad drives at 40 miles per hour, so the time he needs to cover those 100 miles is found by dividing distance by speed: 100 ÷ 40 = 2.5 hours. The decimal 0.5 hour equals 30 minutes because one hour contains 60 minutes, and 0.5 × 60 = 30. Thus, his travel time to reach your location is 2 hours and 30 minutes. This uses the standard relationship among distance, rate, and time: distance = rate × time, or time = distance ÷ rate. See Khan Academy's introduction to rates and Math Is Fun's speed, distance, and time guide.

QUESTION NO: 171



What is the circumference of a circle with center at point A if the distance from point X to Y is 42?

A. 131.88

B. 126.63

C. 9.86

D. 136.93

ANSWER: A

Explanation:

131.88 is correct because the diagram shows that points X and Y lie on opposite sides of the circle and the segment from X to Y passes through point A, the center. Therefore, the given distance of 42 is the diameter, not the radius. Circumference is found by multiplying the diameter by π: C = πd. Substituting 42 for the diameter gives C = 42π. ASVAB-style problems commonly use 3.14 as an approximation for π when answer choices are expressed as terminating decimals. Thus, 42 × 3.14 = 131.88. The circumference is therefore 131.88 units. This result represents the distance around the circle; it is distinct from the straight-line distance across the circle, which is the diameter. Recognizing that a segment through the center connecting two points on the circle is a diameter is the key diagram-reading step before applying the circumference formula. For a review of circle terminology and the circumference relationship, see Khan Academy's circle basics review and Math Is Fun's circumference formula reference.

QUESTION NO: 172

Electric charges can be _____.

A. positive or negative

B. positive or neutral

C. negative or neutral

D. neutral only

ANSWER: A

Explanation:

Electric charges can be **positive or negative**. Charge is a fundamental property of matter associated with certain subatomic particles. Protons carry a positive elementary charge, while electrons carry an equal-magnitude negative elementary charge. An object becomes positively charged when it has a deficit of electrons relative to protons, and it becomes negatively charged when it has an excess of electrons. In ordinary charging processes, such as friction or contact, electrons move between materials; protons remain bound in atomic nuclei.

The term "neutral" describes an object with balanced total positive and negative charge, giving it a net charge of zero. Neutrality is therefore not a third type of electric charge. The two charge types, positive and negative, govern electric interactions: like charges repel, while unlike charges attract. This basic distinction is central to electrostatics and to understanding electric fields, current, and circuits. For further background, see The Physics Classroom: Two Types of Charges and OpenStax College Physics: Static Electricity and Charge Conservation.

QUESTION NO: 173

The textbook presented a finite number of solutions to the problem.

A. unlimited

B. limited

C. variety

D. unusual

ANSWER: B

Explanation:

The correct answer is **limited**. In this sentence, *finite* means having a fixed boundary, limit, or end. Therefore, a finite number of solutions is a number that is restricted rather than endless. The sentence states that the textbook gave only a set, bounded quantity of possible solutions to the problem. This use reflects the standard mathematical and general-English meaning of *finite*: something that is not infinite and can, in principle, be counted or enumerated. For example, a list containing ten solutions is finite because it has a definite total. The relationship between *finite* and *limited* makes **limited** the

best synonym in the context provided. Merriam-Webster defines *finite* as having definite or definable limits, while the Cambridge Dictionary similarly describes it as having a limit or end. See Merriam-Webster: finite and Cambridge Dictionary: finite.

QUESTION NO: 174

The _____ is the part of the electrical system in charge of absorbing excess current.

A. distributor

B. voltage regulator

C. shock absorber

D. coil

ANSWER: B

Explanation:

The **voltage regulator** is the intended answer because it controls the charging system's electrical output to keep it within a safe operating range. In an automotive charging system, the regulator monitors system voltage and adjusts the alternator's field current. When electrical output rises beyond the desired level, it reduces field current, which lowers alternator output and prevents excessive charging current from continuing to flow into the battery and vehicle circuits. This regulation protects electrical components and helps ensure the battery receives the correct charging voltage rather than being overcharged. Although the wording says "absorbing excess current," the underlying charging-system function being tested is voltage regulation: controlling alternator output in response to electrical-system conditions. Modern regulators are often built into the alternator, but their essential role remains the same. The National Automotive Service Task Force describes the voltage regulator as the component that controls alternator output, while an automotive electrical-system overview from Encyclopaedia Britannica identifies the charging system's role in supplying and regulating electrical power. See also the AA1Car charging-system reference for a practical description of regulator-controlled alternator output.

QUESTION NO: 175

A car has a 15-gallon gas tank.

If a car gets 32 miles per gallon and travels 384 miles, how much gas will be left in the tank?

A. 12

B. 6

C. 3

D. 4

ANSWER: C

Explanation:

The correct answer is **3**. First, calculate the amount of fuel used by dividing the distance traveled by the fuel efficiency: 384 miles ÷ 32 miles per gallon = 12 gallons used. The car began with a full 15-gallon tank, so subtract the fuel used from the tank's starting amount: 15 gallons − 12 gallons = 3 gallons remaining. The units are important: "miles per gallon" indicates that each gallon supports 32 miles of travel, so dividing miles by miles per gallon produces gallons. This is a standard rate problem in which distance equals rate multiplied by quantity; equivalently, fuel used equals distance divided by miles-per-gallon. The result is within the tank's capacity and indicates the trip can be completed on a full tank because the vehicle uses fewer than 15 gallons. For additional guidance on solving rate, distance, and unit-rate problems, see Khan Academy's introduction to rates and Math Is Fun's distance, speed, and time overview.

QUESTION NO: 176

The politician exuded charisma.

A. odors

B. falseness

C. charm

D. generosity

ANSWER: C

Explanation:

“charm” is correct because *charisma* means a compelling personal appeal or magnetic quality that makes other people admire, trust, or feel drawn to someone. In the sentence, saying that the politician “exuded charisma” means the politician strongly displayed this appealing presence, perhaps through confidence, persuasive speaking, warmth, or an ability to connect with an audience. “Exuded” is often used figuratively to mean giving off or showing a quality very noticeably, so it reinforces the idea that the politician’s charm was evident to others. This is the closest meaning because charm captures the attractive, influential personal quality implied by *charisma*. Merriam-Webster defines charisma as a personal magic of leadership that arouses special popular loyalty or enthusiasm, while Cambridge describes it as a special power that makes people like or admire someone. Both definitions support interpreting the word in this context as charm. See Merriam-Webster’s definition of charisma and Cambridge Dictionary’s definition of charisma.