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Test Prep CBEST-Section-1-Math

Version Demo

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Topic Break Down

Topic	No. of Questions
Topic 1, Estimation, Measurement, and Statistical Principles	37
Topic 2, Computation and Problem Solving	72
Topic 3, Numerical and Graphic Relationships	10
Total	119

QUESTION NO: 1

Water is coming into a tank three times as fast as it is going out. After one hour, the tank contains 11,400 gallons of water. How fast is the water coming in?

A. 2,850 gallons/hour

B. 3,800 gallons/hour

C. 5,700 gallons/hour

D. 11,400 gallons/hour

E. 17,100 gallons/hour

ANSWER: E

Explanation:

The correct answer is **17,100 gallons/hour**. Let the rate at which water leaves the tank be *w* gallons per hour. Because water enters three times as fast as it leaves, the incoming rate is *3w* gallons per hour. The tank's net rate of increase equals the incoming rate minus the outgoing rate: *3w − w = 2w*. Over one hour, the tank gains 11,400 gallons, so the net rate is 11,400 gallons per hour. Therefore, *2w = 11,400*, giving *w = 5,700* gallons per hour as the outgoing rate. Multiplying that rate by three gives the incoming rate: *3 × 5,700 = 17,100* gallons per hour. This uses the standard rate relationship that net change equals the difference between an amount added per unit time and an amount removed per unit time, multiplied by elapsed time. For related guidance on solving linear equations and rate problems, see Khan Academy's linear equations resources and OpenStax's rate-application overview.

QUESTION NO: 2

What is the estimated product when 157 and 817 are rounded to the nearest hundred and multiplied?

A. 160,000

B. 180,000

C. 16,000

D. 80,000

E. 123,000

ANSWER: A

Explanation:

The correct estimated product is **160,000**. To estimate as requested, round each factor to the nearest hundred before multiplying. The number 157 lies between 100 and 200, and its tens digit is 5, so it rounds up to 200. The number 817 lies between 800 and 900, and its tens digit is 1, so it rounds down to 800. Multiplying the rounded values gives 200 × 800. Since 2 × 8 = 16 and the factors contain four trailing zeros altogether, the product is 160,000. Estimation by rounding is useful when an exact product is unnecessary and a quick, reasonable approximation is needed. The calculation follows the standard place-value convention that a number is rounded to the next higher value when the digit immediately to the right of the target place is 5 or greater. For additional guidance on rounding whole numbers and estimating products, see Khan Academy's rounding whole numbers lesson and Purplemath's rounding overview.

QUESTION NO: 3

Ron is half as old as Sam, who is three times as old as Ted. The sum of their ages is 55. How old is Ron?

A. 5

B. 8

C. 10

D. 15

E. 30

ANSWER: D

Explanation:

The correct answer is **15**. Let Ted's age be *t*. Because Sam is three times Ted's age, Sam's age is *3t*. Ron is half as old as Sam, so Ron's age is half of *3t*, or *3t/2*. Their total age is therefore *t + 3t + 3t/2 = 55*. Combining the whole-number terms gives *4t + 3t/2*. Writing *4t* as *8t/2* gives *11t/2 = 55*. Multiplying both sides by 2 produces *11t = 110*, so Ted is 10 years old. Sam is then 30 years old, and Ron, who is half of Sam's age, is 15 years old. A quick check confirms that 10 + 30 + 15 equals 55, satisfying the condition in the problem. This uses the standard algebraic approach of representing an unknown quantity with a variable and translating verbal relationships into equations. For related guidance on solving linear equations, see Khan Academy's linear-equations resources and OpenStax Elementary Algebra.

QUESTION NO: 4

To lower a fever of 105 degrees, ice packs are applied for 1 minute and then removed for 5 minutes before being applied again. Each application lowers the fever by half a degree. How long will it take to lower the fever to 99 degrees?

A. 36 minutes

B. 1 hour

C. 1 hour and 12 minutes

D. 1 hour and 15 minutes

E. 1 hour and 30 minutes

F. 1 hour and 7 minutes

ANSWER: F

Explanation:

The fever must decrease from 105 degrees to 99 degrees, a total reduction of 6 degrees. Since each one-minute ice-pack application lowers the fever by one-half degree, 12 applications are required: 6 ÷ 0.5 = 12. The first application starts immediately and takes 1 minute. A five-minute removal period occurs only between applications, because once the twelfth application is complete, the target temperature has been reached and no further waiting period is necessary. Thus, the 12 applications take 12 minutes, and the 11 intervals between them take 55 minutes: 11 × 5 = 55. The total time is 12 + 55 = 67 minutes, or 1 hour and 7 minutes. This calculation applies the standard elapsed-time principle of counting only intervals that must occur before the stated result is achieved. For related practice with multistep quantitative reasoning and calculating elapsed time, see the CBEST study guide and the Khan Academy lesson on time intervals.

QUESTION NO: 5

What is the value of 3/4 + 5/8?

A. 1/8

B. 1 1/8

C. 1 3/8

D. 1 5/8

E. 2 1/2

ANSWER: C

Explanation:

The correct answer is **1 3/8**. To add the fractions, first write 3/4 with a denominator of 8. Since 3/4 = 6/8, the sum is 6/8 + 5/8 = 11/8. Converting 11/8 to a mixed number gives 1 3/8.

QUESTION NO: 6

A certain congressional district has about 490,000 people living in it. The largest city in the area has 98,000 citizens.Which most accurately portrays the portion of the population made up by the city in the district?

A. $\frac{1}{5}$

B. $\frac{1}{4}$

C. $\frac{2}{9}$

D. $\frac{3}{4}$

E. $\frac{4}{5}$

A. Option A

B. Option B

C. Option C

D. Option D

E. 1/5

ANSWER: E

Explanation:

The correct portion is **1/5**. The city's share of the congressional district is found by dividing the city population by the total district population: 98,000 ÷ 490,000. Both quantities can be simplified by dividing by 98,000, giving 1 ÷ 5, or 1/5. This is also equal to 0.20, which means the city contains 20% of the district's population. Because the question asks which portrayal is most accurate, the fraction 1/5 directly represents the relationship between the two population counts. Estimation confirms the result: 98,000 is close to 100,000 and 490,000 is close to 500,000; 100,000 ÷ 500,000 is 1/5. Using a ratio or fraction in this way compares a part—the city's population—with the whole—the district's population. For additional review of fractions as division and equivalent representations, see Khan Academy's fraction review and the CBEST testing information.

QUESTION NO: 7

A firefighter checks the gauge on a cylinder that normally contains 45 cubic feet of air and finds that the cylinder has only 10 cubic feet of air. The gauge indicates that the cylinder is

A. $\frac{1}{5}$ full

B. $\frac{1}{4}$ full

C. $\frac{2}{9}$ full

D. $\frac{1}{3}$ full

E. $\frac{4}{5}$ full

A. Option A

B. Option B

C. 2/9

D. Option D

ANSWER: C

Explanation:

The correct answer is **2/9 full**. The fraction of air remaining is found by comparing the amount currently in the cylinder with its normal full capacity. The cylinder contains 10 cubic feet out of a total capacity of 45 cubic feet, so the fraction full is 10/45. Reducing this fraction gives the simplest form: both 10 and 45 are divisible by 5, and dividing each by 5 produces 2/9. Thus, the gauge indicates that the cylinder is 2/9 full. This problem applies a core CBEST Mathematics skill: representing a real-world quantity as a fraction and simplifying that fraction using a common factor. The units cancel because both quantities are measured in cubic feet, leaving a unitless fraction that describes the portion of the cylinder that remains filled. CBEST Mathematics assesses number and quantity skills such as operations with fractions and interpreting quantitative information; see the CBEST Mathematics test specifications and the California educator examinations site.

QUESTION NO: 8

How many feet of ribbon will a theatrical company need to tie off a performance area that is 34 feet long and 20 feet wide?

A. 54

B. 68

C. 88

D. 108

E. 680

ANSWER: D

Explanation:

The correct answer is **108**. Tying ribbon around a rectangular performance area requires enough ribbon to cover its entire boundary, which is the rectangle's perimeter. A rectangle has two equal length sides and two equal width sides. The two 34-foot sides require 34 + 34 = 68 feet of ribbon, while the two 20-foot sides require 20 + 20 = 40 feet. Adding the ribbon needed for all four sides gives 68 + 40 = 108 feet. Equivalently, use the perimeter formula P = 2(l + w): P = 2(34 + 20) = 2(54) = 108. Thus, the company needs 108 feet of ribbon to tie off the full performance area. This applies the standard perimeter concept tested in CBEST mathematics: measuring the total distance around a two-dimensional figure. For a

review of perimeter formulas and their use with rectangles, see Math Is Fun: Perimeter and Khan Academy: Perimeter review.

QUESTION NO: 9

Which number is greatest?

A. 0.602

B. 0.26

C. 0.062

D. 0.62

E. 0.206

ANSWER: D

Explanation:

0.62 is the greatest number. Writing the decimals to the same number of places gives 0.620, 0.602, 0.260, 0.062, and 0.206. The number 0.620 has 6 tenths, while 0.602 also has 6 tenths but only 0 hundredths compared with 2 hundredths in 0.620. Therefore, 0.62 is greater than each of the other choices.

QUESTION NO: 10

A child has a temperature of 40 degrees

C. What is the child's temperature in degrees Fahrenheit? F= 9/5 C + 32.

A. 100 degrees F

B. 101 degrees F

C. 102 degrees F

D. 103 degrees F

E. 104 degrees F

ANSWER: E

Explanation:

The child's temperature is **104 degrees F**. Substitute 40 for C in the provided conversion formula: F = (9/5)C + 32. First calculate 40 × 9/5. Since 40 ÷ 5 = 8, multiplying 8 by 9 gives 72. Then add 32: 72 + 32 = 104. Therefore, 40 degrees Celsius converts exactly to 104 degrees Fahrenheit. This is a standard linear temperature conversion in which the factor 9/5 adjusts the size of Celsius degrees to Fahrenheit degrees and 32 accounts for the different zero points on the two scales. For a real-world reasonableness check, normal human body temperature of about 37 degrees Celsius is approximately 98.6 degrees Fahrenheit, so a temperature of 40 degrees Celsius should be somewhat higher than 100 degrees Fahrenheit; 104 degrees Fahrenheit is consistent with that expectation. The conversion relationship is described by the National Institute of Standards and Technology's temperature-unit guidance and is also available in CDC heat-health information.

QUESTION NO: 11

In the Pinebrook school district last year, 220 students were vaccinated for measles,mumps, and rubella. Of those, 60 percent reported that they had had flu at some time in their lives. How many students had not had the flu previously?

A. 36

B. 55

C. 88

D. 126

E. 132

ANSWER: C

Explanation:

88 is correct because the question asks for the students who had *not* had the flu. Since 60 percent of the 220 vaccinated students reported having had the flu at some point, the remaining percentage is found by taking the complement: 100 percent minus 60 percent equals 40 percent. Thus, 40 percent of the group had not previously had the flu.

Convert 40 percent to a decimal, 0.40, and multiply by the total number of students: 0.40 × 220 = 88. Equivalently, 40 percent is 4/10, so 4/10 of 220 is 88. This approach uses the fact that the two categories—students who had had the flu and students who had not had it—together account for the entire group of 220 students. The result is a whole number of students, as expected. For review of finding a percentage of a quantity, see Khan Academy's percent word problems guide. CBEST mathematics preparation includes computation and problem-solving skills such as percent calculations; see the official CBEST study guide.