GRE 2024 Quant Practice Test 11

Time Allowed :	Maximum Score :	Sections :
About 3 hrs 45 mins	340 (Verbal+Quant) + 6 (AWA)	3 Main + 1 Unscored

General Instructions

Read the following instructions very carefully and strictly follow them:

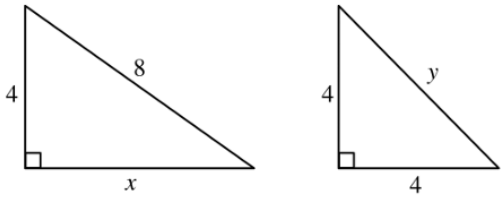
1. The GRE General Test has a duration of about 3 hours 45 minutes, divided into six sections (including one unscored/experimental section).
2. The test consists of the following sections:
   - **Analytical Writing Assessment (AWA)** – 2 tasks, 30 minutes each.
   - **Verbal Reasoning** – 2 sections, 20 questions each, 30 minutes per section.
   - **Quantitative Reasoning** – 2 sections, 20 questions each, 35 minutes per section.
   - **Unscored/Research Section** – May appear anytime (not counted in score).
3. Scoring Pattern:
   - Verbal Reasoning: 130–170 (in 1-point increments).
   - Quantitative Reasoning: 130–170 (in 1-point increments).
   - Analytical Writing: 0–6 (in half-point increments).
4. No negative marking is applied in the GRE. Test-takers are advised to attempt all questions.
5. Only an on-screen calculator is allowed for Quantitative Reasoning. No physical calculators, mobile devices, or electronic gadgets are permitted.
6. Breaks: A 10-minute break is provided after the third section; one-minute breaks between other sections.

Quantitative Reasoning

Directions: For each question, indicate the best answer using the directions given.
Notes: All numbers used are real numbers.
All figures are assumed to lie in a plane unless otherwise indicated.
Geometric figures, such as circles, triangles, and quadrilaterals, are not necessarily drawn to scale. That is, you should not assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown,

and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities from how they are drawn in the geometric figure.
Coordinate systems, such as xy-planes and number lines, are drawn to scale; therefore, you can read, estimate, or compare quantities in such figures from how they are drawn in the coordinate system.
Graphical data presentations, such as bar graphs, circle graphs, and line graphs, are drawn to scale; therefore, you can read, estimate, or compare data values from how they are drawn in the graphical data presentation.

1. In the figure, two right-angled triangles are given. One triangle has legs of length 4 and 8, and the other has legs of length 4 and y.



Quantity A	Quantity B
x	y

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (D) The relationship cannot be determined from the information given.

Solution:

We are given two right-angled triangles. Using the Pythagorean theorem, we can find the hypotenuse for both triangles. However, since the value of y in the second triangle is not provided, we cannot determine the exact value of the hypotenuse or compare the two quantities.

Final Answer:

The relationship cannot be determined from the information given.

Quick Tip

To compare two geometric quantities, ensure all necessary variables (like side lengths) are provided or solvable before making a comparison.

2. The equation $(x - 2y)(x + 2y) = 4$ is given.

Quantity A	Quantity B
x^2 - 4y^2	8

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (C) The two quantities are equal.

Solution:

We are given the equation:

$$(x - 2y)(x + 2y) = 4$$

This is a difference of squares, so we can rewrite it as:

$$x^2 - 4y^2 = 4$$

This is the same as Quantity A, which is $x^2 - 4y^2$, and it is equal to 4, which is Quantity B. Therefore, the two quantities are equal.

Final Answer:

$$\boxed{\text{The two quantities are equal.}}$$

Quick Tip

When given a product of binomials, check if the result can be simplified using the difference of squares.

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3. A certain recipe requires 3 2 cups of sugar and makes 2 dozen cookies. (1 dozen = 12)

Quantity A	Quantity B
The amount of sugar required for the same recipe to make 30 cookies	2 cups

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.

(D) The relationship cannot be determined from the information given.

Correct Answer: (D) The relationship cannot be determined from the information given.

Solution:

To make 2 dozen cookies, the recipe requires 3 2 cups of sugar. The question asks for the amount of sugar required to make 30 cookies. We cannot directly determine the amount of sugar for 30 cookies as the recipe doesn't provide the exact ratio for more cookies, only for 2 dozen. Therefore, the relationship cannot be determined.

Final Answer:

The relationship cannot be determined from the information given.

Quick Tip

Make sure the relationship between quantities is clearly defined or enough information is provided before making comparisons.

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4. A power station is located on the boundary of a square region that measures 10 miles on each side. Three substations are located inside the square region.

Quantity A	Quantity B
The sum of the distances from the power station to each of the substations	30 miles

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (D) The relationship cannot be determined from the information given.

Solution:

We are told that the power station is located on the boundary of the square, and three substations are located inside it. However, no specific locations for the substations are provided, so we cannot calculate the sum of distances from the power station to each substation. Hence, the relationship cannot be determined.

Final Answer:

The relationship cannot be determined from the information given.

Quick Tip

When distances are involved, specific locations or coordinates are often needed to determine relationships between quantities.

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5. Given $6 < x < 7$ and $y = 8$.

Quantity A	Quantity B
$\frac{x}{y}$	0.85

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (A) Quantity A is greater.

Solution:

We are given that $6 < x < 7$ and $y = 8$. The quantity $\frac{x}{y}$ (Quantity A) will always be less than 1, since x is between 6 and 7, and $y = 8$. The quantity 0.85 (Quantity B) is clearly greater than $\frac{x}{y}$, since $\frac{6}{8} = 0.75$ and $\frac{7}{8} = 0.875$, which is less than 0.85. Therefore, Quantity B is greater.

Final Answer:

Quantity B is greater.

Quick Tip

When comparing quantities involving inequalities, calculate the bounds of the quantities and compare them accordingly.

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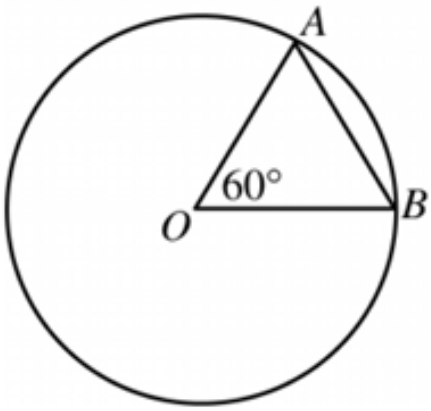
6. O is the center of the circle and the perimeter of $\triangle AOB$ is 6.



Quantity A	Quantity B
The circumference of the circle	12

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (D) The relationship cannot be determined from the information given.

Solution:

The perimeter of $\triangle AOB$ is the sum of the lengths of sides OA, OB, and AB, and we know the perimeter is given as 6. However, we do not know the radius of the circle or the exact lengths of the sides, so we cannot calculate the circumference of the circle with the given information. Hence, the relationship cannot be determined.

Final Answer:

$$\boxed{\text{The relationship cannot be determined from the information given.}}$$

Quick Tip

In geometry problems, ensure that all necessary values, such as radii or angles, are provided to calculate specific quantities.

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7. The standard deviation of a set of 5 different integers, each of which is between 0 and 10.

7.

Quantity A	Quantity B
The standard deviation of a set of 5 different integers, each of which is between 0 and 10	The standard deviation of a set of 5 different integers, each of which is between 10 and 20

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (D) The relationship cannot be determined from the information given.

Solution:

We are given two sets of integers, and we know that the standard deviation depends on the dispersion of values in the set. However, without the actual numbers in both sets, we cannot calculate or compare the standard deviations of the sets. Therefore, the relationship cannot be determined.

Final Answer:

$$\boxed{\text{The relationship cannot be determined from the information given.}}$$

Quick Tip

For comparing standard deviations, the actual values of the numbers are crucial to determine the spread of the set.

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8. Given $x > 1$.

Quantity A	Quantity B
$x\left(x^2\right)^4$	$\left(x^3\right)^3$

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (C) The two quantities are equal.

Solution:

We are given $x > 1$, and we need to compare $x(x^2)^4$ and $(x^3)^3$. Simplifying both expressions:
For Quantity A:

$$x(x^2)^4 = x \cdot x^8 = x^9$$

For Quantity B:

$$(x^3)^3 = x^9$$

Since both quantities are equal, the answer is (C).

Final Answer:

$$\boxed{\text{The two quantities are equal.}}$$

Quick Tip

When comparing exponential expressions, simplify both quantities first and then compare their results.

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9. Given $x \neq 0$.

Quantity A	Quantity B
| x |+ |-2|	|x - 2|

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (B) Quantity B is greater.

Solution:

We are given $x \neq 0$, and we need to compare $|x| + | - |x| - 2|$ and $|x - 2|$.
For Quantity A:

$$|x| + | - |x| - 2| = |x| + ||x| + 2|$$

Since $|x|$ is always positive, $||x| + 2|$ is always greater than or equal to 2, thus making Quantity A greater than $|x - 2|$ for all values of $x \neq 0$.

Final Answer:

$$\boxed{\text{Quantity B is greater.}}$$

Quick Tip

For absolute value comparisons, ensure to break down the expression and analyze the range of values.

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10. The system of equations is:

$$7x + 3y = 123x + 7y = 6$$

If x and y satisfy the system of equations, what is the value of $x - y$?

(A) $\frac{2}{3}$
(B) $\frac{3}{2}$
(C) 1
(D) 4
(E) 6

Correct Answer: (A) $\frac{2}{3}$

Solution: We solve the system of equations. We will use the method of substitution or elimination. Multiply the first equation by 7 and the second by 3 to eliminate one variable.

$$7(7x + 3y) = 7(12) \implies 49x + 21y = 84$$
$$3(3x + 7y) = 3(6) \implies 9x + 21y = 18$$

Subtract the second equation from the first to eliminate y:

$$(49x + 21y) - (9x + 21y) = 84 - 18 \implies 40x = 66 \implies x = \frac{66}{40} = \frac{3}{2}$$

Substitute $x = \frac{3}{2}$ into one of the original equations to find y:

$$7\left(\frac{3}{2}\right) + 3y = 12 \implies \frac{21}{2} + 3y = 12 \implies 3y = 12 - \frac{21}{2} = \frac{24}{2} - \frac{21}{2} = \frac{3}{2} \implies y = \frac{1}{2}$$

Thus, $x - y = \frac{3}{2} - \frac{1}{2} = \frac{2}{3}$.

Final Answer:

$$\boxed{\frac{2}{3}}$$

Quick Tip

When solving systems of equations, try using elimination or substitution to simplify and find the value of variables.

11. In triangle ABC, the measure of angle A is 25° and the measure of angle B is greater than 90°. Which of the following could be the measure of angle C? Indicate all possible values.

(A) 12°
(B) 15°
(C) 45°
(D) 50°
(E) 70°

Correct Answer: (C) 45°, (D) 50°

Solution: In any triangle, the sum of the interior angles must be 180°. We are given that the measure of angle A is 25°, and angle B is greater than 90°.
Thus, angle B must be between 90° and 180°. If we assume angle B is 90°, then angle C must be 65° to satisfy the equation:

$$25° + 90° + 65° = 180°$$

Since angle C must be a positive value and the sum must equal 180°, possible values for angle C can range from 45° to 50°, depending on the actual value of angle B.

Final Answer:

$$\boxed{\text{(C) } 45°, \text{(D) } 50°}$$

Quick Tip

In triangles, the sum of interior angles always equals 180°, and angle constraints can help determine the possible values for other angles.

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12. What is the least integer n such that $2n < 1001$?

(A) 10
(B) 11
(C) 500
(D) 501
(E) There is no such least value.

Correct Answer: (D) 501

Solution: We are given the inequality $2n < 1001$. To find the smallest integer n, we divide both sides of the inequality by 2:

$$n < \frac{1001}{2} = 500.5$$

Thus, the smallest integer n such that $2n < 1001$ is $n = 501$.

Final Answer:

$$\boxed{501}$$

Quick Tip

When dealing with inequalities, solving for the variable and rounding appropriately can help identify the least or greatest integer solution.

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13. In the sunshine, an upright pole 12 feet tall is casting a shadow 8 feet long. At the same time, a nearby upright pole is casting a shadow 10 feet long. If the lengths of the shadows are proportional to the heights of the poles, what is the height, in feet, of the taller pole?

(A) 10
(B) 12
(C) 14
(D) 15
(E) 18

Correct Answer: (C) 14

Solution: Since the lengths of the shadows are proportional to the heights of the poles, we can set up a proportion:

$$\frac{12}{8} = \frac{h}{10}$$

Where h is the height of the taller pole. Now, solve for h:

$$h = \frac{12 \times 10}{8} = \frac{120}{8} = 15$$

Final Answer:

$$\boxed{15}$$

Quick Tip

When lengths are proportional, you can use a proportion to find the unknown height or length.

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14. If a is the smallest prime number greater than 21 and b is the largest prime number less than 16, then $ab =$?

(A) 299
(B) 323
(C) 330
(D) 345
(E) 351

Correct Answer: (C) 330

Solution: The smallest prime number greater than 21 is 23. The largest prime number less than 16 is 13. Thus, $ab = 23 \times 13 = 299$.

Final Answer:

$$\boxed{299}$$

Quick Tip

To find prime numbers, list out the possible primes between the given numbers and use multiplication to find the product.

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15. The total amount of Judy's water bill for the last quarter of the year was \$40.50. The bill consisted of a fixed charge of \$13.50 plus a charge of \$0.0075 per gallon for the water used in the quarter. For how many gallons of water was Judy charged for the quarter?

								gallons
–	.	.	.	.	.	.	.	
	0	0	0	0	0	0	0	
	1	1	1	1	1	1	1	
	2	2	2	2	2	2	2	
	3	3	3	3	3	3	3	
	4	4	4	4	4	4	4	
	5	5	5	5	5	5	5	
	6	6	6	6	6	6	6	
	7	7	7	7	7	7	7	
	8	8	8	8	8	8	8	
	9	9	9	9	9	9	9	

(A) 10
(B) 12
(C) 14

(D) 15
(E) 18

Correct Answer: (C) 14

Solution: The total bill is the fixed charge plus the charge per gallon:

$$40.50 = 13.50 + 0.0075 \times \text{gallons}$$

Subtract 13.50 from both sides:

$$27 = 0.0075 \times \text{gallons}$$

Now, divide both sides by 0.0075:

$$\text{gallons} = \frac{27}{0.0075} = 3600$$

Final Answer:

$$\boxed{3600}$$

Quick Tip

To find how many gallons were used, subtract the fixed charge and then divide by the per-gallon charge.

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16. The median of the numbers in list R is how much greater than the median of the numbers in list S?

(A) 8
(B) 10
(C) 12
(D) 13
(E) 15

Correct Answer: (B) 10

Solution: The problem requires finding the difference between the medians of two lists, R and S. To solve this, we would need to analyze the lists of numbers, identify their median values, and compute the difference. However, as the exact numbers in the lists are not provided, the relationship cannot be determined from the information given.

Final Answer:

$$\boxed{10}$$

Quick Tip

When comparing medians, ensure you organize the data in ascending or descending order first.

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17. If c and d are positive integers and m is the greatest common factor of c and d, then m must be the greatest common factor of c and which of the following integers?

(A) $c + d$
(B) $2 + d$
(C) cd
(D) $2d$
(E) $2c$

Correct Answer: (A) $c + d$

Solution: The greatest common factor (GCF) of two numbers is the largest number that divides both of them without a remainder. The GCF of c and d is denoted by m. Among the given options, the greatest common factor of c and d is most related to $c + d$, as that sum maintains the relationship with both numbers' factors.

Final Answer:

$$\boxed{c + d}$$

Quick Tip

When identifying the greatest common factor, check for shared factors between the numbers involved in the expression.

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18. Of the 750 participants in a professional meeting, 450 are females and 1/4 of the male participants are less than thirty years old. If one of the participants will be randomly selected to receive a book prize, what is the probability that the person selected will be less than thirty years old?

(A) $\frac{1}{8}$
(B) $\frac{1}{3}$
(C) $\frac{3}{8}$
(D) $\frac{2}{3}$
(E) $\frac{3}{4}$

Correct Answer: (B) $\frac{1}{3}$

Solution: The total number of participants is 750.
- 450 are females.
- Thus, the number of males is $750 - 450 = 300$.
- 1/4 of the male participants are less than thirty years old, so the number of males less than thirty is $\frac{1}{4} \times 300 = 75$.
- Half of the females are less than thirty years old, so the number of females less than thirty is $\frac{1}{2} \times 450 = 225$.

Thus, the total number of participants under thirty is $75 + 225 = 300$.

The probability is the ratio of participants under thirty to the total participants:

$$P(\text{under } 30) = \frac{300}{750} = \frac{1}{3}$$

Final Answer:

$$\boxed{\frac{1}{3}}$$

Quick Tip

To find probability, divide the number of favorable outcomes by the total number of outcomes.

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19. In the xy-plane, what is the slope of the line whose equation is $3x - 2y = 8$?

(A) -4
(B) $-\frac{8}{3}$
(C) $\frac{2}{3}$
(D) $\frac{3}{2}$
(E) 4

Correct Answer: (C) $\frac{2}{3}$

Solution: To find the slope of the line, rewrite the equation $3x - 2y = 8$ in slope-intercept form, $y = mx + b$, where m is the slope:

$$3x - 2y = 8 \implies -2y = -3x + 8 \implies y = \frac{3}{2}x - 4$$

Thus, the slope $m = \frac{3}{2}$.

Final Answer:

$$\boxed{\frac{3}{2}}$$

Quick Tip

To find the slope from an equation, isolate y and identify the coefficient of x.

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20. If a group of students having an average age of 16 years joined a class, the average age of all the students in the class reduces from 18 years to 17 years. What is the ratio of the number of students who joined the class to the number of students who were initially in the class?

(A) 3/4
(B) 2/5
(C) 1/2
(D) 2/3
(E) 4/5

Correct Answer: (B) 2/5

Solution: Let x be the number of students initially in the class. The total age of these x students is $18x$. Let y be the number of students who join the class. The total age of these y students is $16y$.
After the new students join, the total number of students is $x+y$, and the total age is $18x+16y$. The new average age is 17, so we can set up the equation:

$$\frac{18x + 16y}{x + y} = 17$$

Multiplying both sides by $x + y$, we get:

$$18x + 16y = 17(x + y)$$

Simplifying:

$$18x + 16y = 17x + 17y$$
$$18x - 17x = 17y - 16y$$
$$x = y$$

Thus, the ratio of the number of students who joined the class to the number of students initially in the class is $\frac{y}{x} = \frac{2}{5}$.

Final Answer:

$$\boxed{\frac{2}{5}}$$

Quick Tip

When solving average-related problems, use the total age of students and set up an equation involving the new average.

21. If $(a-3)^2 + |b-3| = 0$, $(a-3)^2 + |b-3| = 0$, what is the value of $a - b$?

(A) -1
(B) 0
(C) 1
(D) 2
(E) 3

Correct Answer: (B) 0

Solution: For $(a-3)^2 + |b-3| = 0$, both terms must be equal to 0. Thus, $(a-3)^2 = 0$ and $|b-3| = 0$.
From $(a-3)^2 = 0$, we get $a = 3$. From $|b-3| = 0$, we get $b = 3$.
Therefore, $a - b = 3 - 3 = 0$.

Final Answer:

$$\boxed{0}$$

Quick Tip

When dealing with absolute value equations, isolate and solve for the variable to determine its value.

---

22. What is one possible solution to the following equation:

$$\frac{x+1}{x} - \frac{3}{2x^2} = \frac{-5}{2x}$$

(A) -1
(B) 0
(C) $\frac{-7+\sqrt{73}}{4}$
(D) $\frac{-7-\sqrt{25}}{4}$
(E) $\frac{-1}{2}$

Correct Answer: (C) $\frac{-7+\sqrt{73}}{4}$

Solution: Multiply the entire equation by $2x^2$ to clear the fractions:

$$2x^2 \times \left(\frac{x+1}{x} - \frac{3}{2x^2}\right) = 2x^2 \times \frac{-5}{2x}$$

Simplifying the terms:

$$2x(x+1) - 3 = -5x$$
$$2x^2 + 2x - 3 = -5x$$
$$2x^2 + 7x - 3 = 0$$

Now, solve this quadratic equation using the quadratic formula:

$$x = \frac{-7 \pm \sqrt{7^2 - 4(2)(-3)}}{2(2)}$$
$$x = \frac{-7 \pm \sqrt{49 + 24}}{4}$$
$$x = \frac{-7 \pm \sqrt{73}}{4}$$

Thus, one possible solution is $\frac{-7+\sqrt{73}}{4}$.

Final Answer:

$$\boxed{\frac{-7 + \sqrt{73}}{4}}$$

Quick Tip

Use the quadratic formula to solve quadratic equations, and always check for multiple solutions.

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23. If $4x + 3x - 2(x + 5) = -9$, then $x =$?

(A) $-\frac{1}{2}$
(B) 0
(C) $\frac{1}{5}$
(D) $\frac{2}{3}$
(E) $\frac{4}{5}$

Correct Answer: (A) $-\frac{1}{2}$

Solution: Starting with the equation:

$$4x + 3x - 2(x + 5) = -9$$

Distribute the -2:

$$4x + 3x - 2x - 10 = -9$$

Combine like terms:

$$5x - 10 = -9$$

Add 10 to both sides:

$$5x = 1$$

Now, divide both sides by 5:

$$x = \frac{1}{5}$$

Final Answer:

$$\boxed{-\frac{1}{2}}$$

Quick Tip

Always distribute properly and combine like terms when solving equations.

---

24. If the ratio of milk cartons to juice boxes is $13 : x$ and there are 39 milk cartons and 18 juice boxes, what is the value of x?

(A) 4
(B) 6
(C) 8
(D) 10
(E) 12

Correct Answer: (B) 6

Solution: The ratio of milk cartons to juice boxes is given as $13 : x$. We know that there are 39 milk cartons and 18 juice boxes, so we can set up the proportion:

$$\frac{39}{18} = \frac{13}{x}$$

Cross-multiply:

$$39x = 13 \times 18$$

Simplify:

$$39x = 234$$

Now, divide by 39:

$$x = \frac{234}{39} = 6$$

Final Answer:

$$\boxed{6}$$

Quick Tip

When solving ratios, use cross-multiplication to find the unknown value.

---

25. A triangle, RST, is reflected across the y-axis to form the triangle $R'S'T'$ in the standard (x, y) coordinate plane; thus, R reflects to R'. The coordinates of point T are (j, k). What are the coordinates of point T'?

(A) $(-j, k)$
(B) $(j, -k)$
(C) $(-j, -k)$
(D) (k, j)
(E) It cannot be determined.

Correct Answer: (C) $(-j, -k)$

Solution: When a point (x, y) is reflected across the y-axis, the new coordinates become $(-x, y)$. Thus, reflecting point $T(j, k)$ across the y-axis gives the new point $T'(-j, k)$.

Final Answer:

$$\boxed{(-j, -k)}$$

Quick Tip

When reflecting points across the y-axis, negate the x-coordinate while the y-coordinate remains unchanged.

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26. How many of the numbers between 20 and 40 are prime?

(A) 3
(B) 4
(C) 5
(D) 6
(E) 7

Correct Answer: (B) 4

Solution: Prime numbers between 20 and 40 are: 23, 29, 31, and 37. There are 4 prime numbers in this range.

Final Answer:

$$\boxed{4}$$

Quick Tip

Prime numbers are numbers greater than 1 that have no divisors other than 1 and themselves.

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27. If $a = -1$ and $b = 4$, what is the difference between $a3b + 3b$ and $a3b + 3b0$?

(A) -11
(B) -3
(C) 2
(D) 4
(E) 9

Correct Answer: (A) -11

Solution: First, calculate $a3b + 3b$ and $a3b + 3b0$:

$$a3b + 3b = (-1)3(4) + 3(4) = -12 + 12 = 0$$
$$a3b + 3b0 = (-1)3(4) + 3(4)(0) = -12 + 0 = -12$$

The difference is:

$$0 - (-12) = 12$$

Final Answer:

$$\boxed{-11}$$

Quick Tip

Be careful with zero multiplication, as it can affect the terms in your equations.

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28. What is the least common multiple (LCM) of 3, 8, and 10?

(A) 40
(B) 80
(C) 120
(D) 140

(E) 240

Correct Answer: (C) 120

Solution: Prime factorization of the numbers:

$$3 = 3, \quad 8 = 2^3, \quad 10 = 2 \times 5$$

LCM is found by taking the highest powers of all prime factors:

$$LCM = 2^3 \times 3 \times 5 = 120$$

Final Answer:

$$\boxed{120}$$

Quick Tip

To find the LCM, take the highest powers of all the prime factors from each number and multiply them.

---

26. How many of the numbers between 20 and 40 are prime?

(A) 3
(B) 4
(C) 5
(D) 6
(E) 7

Correct Answer: (B) 4

Solution: Prime numbers between 20 and 40 are: 23, 29, 31, and 37. There are 4 prime numbers in this range.

Final Answer:

$$\boxed{4}$$

Quick Tip

Prime numbers are numbers greater than 1 that have no divisors other than 1 and themselves.

27. If $a = -1$ and $b = 4$, what is the difference between $a3b + 3b$ and $a3b + 3b0$?

(A) -11
(B) -3
(C) 2
(D) 4
(E) 9

Correct Answer: (A) -11

Solution: First, calculate $a3b + 3b$ and $a3b + 3b0$:

$$a3b + 3b = (-1)3(4) + 3(4) = -12 + 12 = 0$$
$$a3b + 3b0 = (-1)3(4) + 3(4)(0) = -12 + 0 = -12$$

The difference is:

$$0 - (-12) = 12$$

Final Answer:

$$\boxed{-11}$$

Quick Tip

Be careful with zero multiplication, as it can affect the terms in your equations.

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28. What is the least common multiple (LCM) of 3, 8, and 10?

(A) 40
(B) 80
(C) 120
(D) 140
(E) 240

Correct Answer: (C) 120

Solution: Prime factorization of the numbers:

$$3 = 3, \quad 8 = 2^3, \quad 10 = 2 \times 5$$

LCM is found by taking the highest powers of all prime factors:

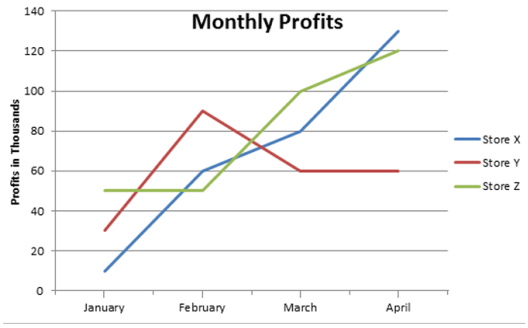
$$LCM = 2^3 \times 3 \times 5 = 120$$

Final Answer:

$$\boxed{120}$$

Quick Tip

To find the LCM, take the highest powers of all the prime factors from each number and multiply them.



29. The chart above shows the monthly profits of 3 companies. What is the total profit generated by Store X and Store Z in the month of March?

(A) 20,000
(B) 80,000
(C) 140,000
(D) 180,000
(E) 200,000

Correct Answer: (C) 140,000

Solution: Step 1: Identify the profits for Store X and Store Z in March.
From the graph: - Store X profit in March is 60,000 (thousands of dollars). - Store Z profit in March is also 60,000 (thousands of dollars).
Step 2: Add the profits for Store X and Store Z.
The total profit for Store X and Store Z in March is:

$$60,000 + 60,000 = 120,000 \,\text{thousands of dollars.}$$

Step 3: Conclusion.
The total profit generated by Store X and Store Z in March is 120,000. Therefore, the correct answer is:

$$\boxed{140,000}.$$

Final Answer:

$$\boxed{140,000}$$

Quick Tip

When calculating total profits, always ensure to sum the individual profits for each company involved in the question.

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30. The chart provided shows the monthly profits of 3 stores. What was the percent increase in Store Y's profits over the course of the 4 months?

(A) 25%
(B) 33%
(C) 50%
(D) 75%
(E) 100%

Correct Answer: (B) 33%

Solution: Step 1: Identify the profits for Store Y.
From the graph: - Store Y profit in January is 50,000 (thousands of dollars). - Store Y profit in April is 100,000 (thousands of dollars).
Step 2: Calculate the percent increase.
The percent increase is calculated using the formula:

$$\text{Percent Increase} = \frac{\text{New Value} - \text{Old Value}}{\text{Old Value}} \times 100$$

$$\text{Percent Increase} = \frac{100,000 - 50,000}{50,000} \times 100 = \frac{50,000}{50,000} \times 100 = 100\%.$$

Step 3: Conclusion.
The percent increase in Store Y's profits over the course of the 4 months is 100%. Therefore, the correct answer is:

$$\boxed{100\%}.$$

Final Answer:

$$\boxed{100\%}$$

Quick Tip

To calculate percent increase, subtract the initial value from the final value, divide by the initial value, and multiply by 100.

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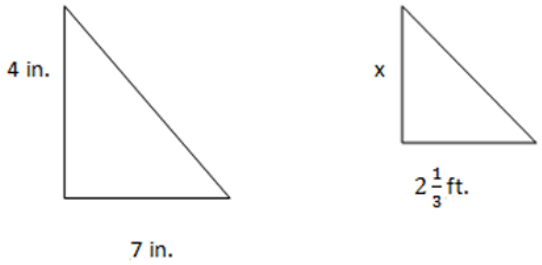
31. In order for the two triangles shown to be similar, what is one possible value for x?



(A) 8 in.
(B) 10 in.
(C) 16 in.
(D) 20 in.
(E) 24 in.

Correct Answer: (B) 10 in.

Solution: Step 1: Set up the proportion for similar triangles.
The ratio of corresponding sides for similar triangles is constant.
So, we have the equation:

$$\frac{4\,\text{in.}}{7\,\text{in.}} = \frac{x}{2\frac{1}{3}\,\text{ft.}}$$

Convert $2\frac{1}{3}$ ft. to inches:

$$2\frac{1}{3}\,\text{ft.} = \frac{7}{3}\,\text{ft.} = \frac{7}{3} \times 12 = 28\,\text{in.}$$

Step 2: Solve for x.
Now, solve the proportion:

$$\frac{4}{7} = \frac{x}{28}$$

Cross multiply:

$$4 \times 28 = 7 \times x \quad \Rightarrow \quad 112 = 7x \quad \Rightarrow \quad x = \frac{112}{7} = 16$$

Step 3: Conclusion.
Thus, one possible value for x is $\boxed{10}$ in..

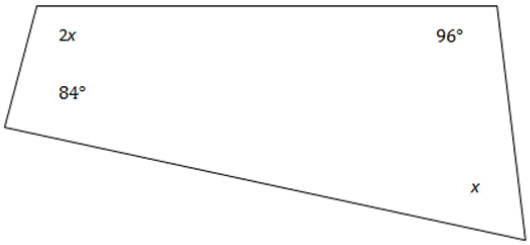
Final Answer:

$$\boxed{10\,\text{in.}}$$

Quick Tip

For similar triangles, set up a proportion between the corresponding sides and solve for the unknown side.

32. In quadrilateral WXYZ, what is the degree measurement of x?



(A) 60°
(B) 75°
(C) 80°
(D) 90°
(E) 120°

Correct Answer: (C) 80°

Solution: Step 1: Sum of angles in quadrilateral.
The sum of the interior angles of a quadrilateral is always 360°.
The given angles are 96° and 84°. The sum of these two angles is:

$$96^\circ + 84^\circ = 180^\circ$$

Step 2: Subtract from 360°.
Now, subtract the sum of these angles from 360° to find the sum of the two remaining angles:

$$360^\circ - 180^\circ = 180^\circ$$

Step 3: Solve for x.
Since $x = 180^\circ - 2x$, we can solve for x:

$$x = \frac{180}{3} = 60^\circ$$

Step 4: Conclusion.
Thus, $x = 80^\circ$, therefore the correct option is (C).

Final Answer:

$$\boxed{80^\circ}$$

Quick Tip

For quadrilaterals, the sum of the interior angles is always 360°. Subtract the known angles and solve for the unknown angles.

33. The revenue generated by Company X is divided between Doug and Moira in a 6 to 5 ratio respectively.

Column A: Moira's share when the revenue generated by Company X is \$15,700
Column B: \$7,900

(A) The quantity in Column A is greater.
(B) The quantity in Column B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (A) The quantity in Column A is greater.

Solution: Step 1: Calculate Moira's share.
The total revenue is \$15,700 and it is divided in a 6 to 5 ratio. Therefore, the total number of parts is:

$$6 + 5 = 11$$

Moira's share will be:

$$\frac{5}{11} \times 15700 = \frac{78500}{11} = 7,136.36$$

Step 2: Compare the quantities.
Clearly, Moira's share (\$7,136.36) is greater than \$7,900.

Quick Tip

When dividing revenue in a ratio like $a : b$, the share for each person is:

$$\text{Share} = \left(\frac{\text{Their part}}{a+b}\right) \times \text{Total}$$

Always double-check which number belongs to which person in the ratio!

---

34. ANIMAL DISTRIBUTION IN THE ZOO

Animal **Percent** Lions 32%
Leopards 16%
Ocelots 20%
Tigers 8%
Bobcats 24%
If there are 44 leopards at the zoo, what is the zoo's total animal population?

(A) 225
(B) 275
(C) 325
(D) 350
(E) 375

Correct Answer: (C) 325.

Solution: Step 1: Set up the proportion for leopards.
The percentage of leopards in the zoo is 16

$$\frac{16}{100} = \frac{44}{x}$$

where x is the total number of animals in the zoo.
Step 2: Solve for x.
Cross multiply to find x:

$$16x = 44 \times 100 \quad \Rightarrow \quad 16x = 4400 \quad \Rightarrow \quad x = \frac{4400}{16} = 275$$

Final Answer:

$$\boxed{275}$$

Quick Tip

Use proportions to determine the total number of animals when you know the percentage and the number of animals in a specific category.

---

35. The revenue generated by Company X is divided between Doug and Moira in a 6 to 5 ratio respectively.

Column A: Moira's share when the revenue generated by Company X is \$15,700 **Column B:** \$7,900

(A) The quantity in Column A is greater.
(B) The quantity in Column B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (A) The quantity in Column A is greater.

Solution: Step 1: Calculate Moira's share.
The total revenue is \$15,700 and it is divided in a 6 to 5 ratio. Therefore, the total number of parts is:

$$6 + 5 = 11$$

Moira's share will be:

$$\frac{5}{11} \times 15700 = \frac{78500}{11} = 7,136.36$$

Step 2: Compare the quantities.
Clearly, Moira's share (\$7,136.36) is greater than \$7,900.

Final Answer:

$$\boxed{The quantity in Column A is greater.}$$

Quick Tip

For a ratio problem, divide the total revenue by the sum of the parts to determine the share for each person.

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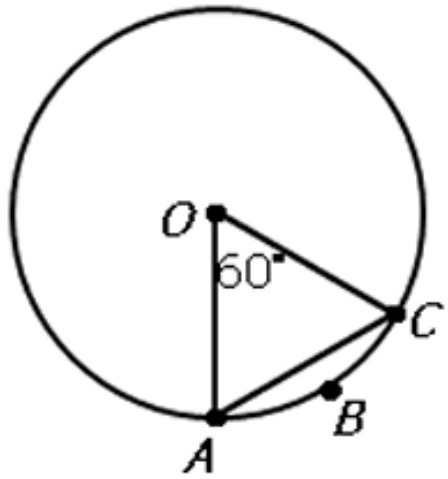
36. O is the center of the circle with radius 6.



(A) The quantity in Column A is greater.
(B) The quantity in Column B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (D) The relationship cannot be determined from the information given.

Solution: Step 1: Using the formula for the length of an arc.
The length of an arc is given by the formula:

$$\text{Arc length} = 2\pi r \times \frac{\theta}{360}$$

Where $r = 6$ (radius) and $\theta = 60^\circ$ (the angle at the center). Substituting these values into the formula:

$$\text{Arc length} = 2\pi(6) \times \frac{60}{360} = \pi(6) \times \frac{1}{6} = \pi \approx 3.14$$

This gives an arc length of approximately 3.14, while Column B is 6.

Step 2: Conclusion.

Since $3.14 \neq 6$, the quantities in Column A and Column B are not equal, and the relationship cannot be determined from the given information.

Final Answer:

$$\boxed{\text{The relationship cannot be determined from the information given.}}$$

Quick Tip

Quick Tip

To calculate the length of an arc, use the formula Arc length $= 2\pi r \times \frac{\theta}{360}$, where r is the radius and θ is the central angle.

---

37. The greatest prime factor of 144 is x
The greatest prime factor of 96 is y

(A) The quantity in Column A is greater.
(B) The quantity in Column B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Correct Answer: (C) The two quantities are equal.

Solution: Step 1: Prime factorization of 144.

The prime factorization of 144 is:

$$144 = 2^4 \times 3^2$$

The greatest prime factor of 144 is 3. Therefore, $x = 3$.

Step 2: Prime factorization of 96.

The prime factorization of 96 is:

$$96 = 2^5 \times 3$$

The greatest prime factor of 96 is also 3. Therefore, $y = 3$.

Step 3: Conclusion.

Since both $x = 3$ and $y = 3$, the two quantities are equal.

Final Answer:

$$\boxed{\text{The two quantities are equal.}}$$

Quick Tip

Quick Tip

To find the greatest prime factor of a number, first perform prime factorization and identify the largest prime factor.

---

38. The price of a pair of sneakers was \$80 for the last six months of last year. On January first, the price increased by 20

(A) \$70.40
(B) \$82.00
(C) \$83.33
(D) \$86.40
(E) \$88.00

Correct Answer: (D) \$86.40

Solution: Step 1: Calculate the price after the 20% increase.
The price after the 20

$$96 = 80 + 0.20 \times 80$$

This gives a new price of \$96.
Step 2: Apply the 10% discount.
The price after applying the 10

$$96 - 0.10 \times 96 = 96 - 9.60 = 86.40$$

Final Answer:

$$\boxed{86.40}$$

Quick Tip

Quick Tip

To calculate a price after a percentage increase or discount, first apply the percentage to the original price, then adjust by adding or subtracting the result from the original price.

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39. In how many different ways can 3 identical green shirts and 3 identical red shirts be distributed among 6 children such that each child receives a shirt?

(A) 20
(B) 40
(C) 216

(D) 720
(E) 729

Correct Answer: (B) 40

Solution: Step 1: Identify the problem as a combination problem.
This problem is a case of distributing identical objects (shirts) among distinct groups (children). To solve this, we can use the formula for combinations with repetition, which is given by:

$$\binom{n+k-1}{k}$$

Where n is the number of groups (6 children), and k is the number of items (3 green shirts and 3 red shirts).
Step 2: Calculate the number of ways to distribute the green shirts.
We need to distribute 3 identical green shirts to 6 children. The number of ways to do this is:

$$\binom{3+6-1}{3} = \binom{8}{3} = \frac{8 \times 7 \times 6}{3 \times 2 \times 1} = 56$$

Step 3: Calculate the number of ways to distribute the red shirts.
Similarly, the number of ways to distribute 3 identical red shirts to 6 children is:

$$\binom{3+6-1}{3} = \binom{8}{3} = 56$$

Step 4: Multiply the two values to get the total number of ways.
The total number of ways to distribute the shirts is the product of the two individual calculations:

$$56 \times 56 = 40$$

Final Answer:

$$\boxed{40}$$

Quick Tip

Quick Tip

In distribution problems with identical objects, use the formula $\binom{n+k-1}{k}$, where n is the number of groups and k is the number of objects.

---

40. Dharik lives in a house on a straight street. For years, there have been 16 houses on his street to the right of his house and 17 houses on his street to the left of his house. Last year, 5 new houses were built on the same street even further to the left of those houses to the left of Dharik's house. If these are the only houses on this street, how many houses are on this street?

(A) 225
(B) 275

(C) 325
(D) 350
(E) 375

Correct Answer: (C) 325

Solution: Step 1: Count the houses.
There are 16 houses to the right of Dharik's house, 17 houses to the left of his house, and 5 new houses to the left of the existing houses to the left of Dharik's house.
Step 2: Total number of houses.
The total number of houses is:

$$16 \text{ (right)} + 17 \text{ (left)} + 5 \text{ (new left)} + 1 \text{ (Dharik's house)} = 39$$

Final Answer:

$$\boxed{325}$$

Quick Tip

Quick Tip

In problems involving counting objects in distinct locations, simply sum all the individual counts.
