GRE Quantitative Reasoning Practice Test-5, 2024 with Solutions

Time Allowed : 1 Hour 58 Minutes	**Maximum Marks :** 340

General Instructions

Read the following instructions very carefully and strictly follow them:

1. There is no penalty for incorrect answers on the Verbal Reasoning and Quantitative Reasoning sections. This means you should always answer every question, even if you have to guess.
2. Within any section of the test, you can mark questions you want to review and change your answers as long as the time for that section has not expired.
3. The Analytical Writing section is always presented first. The Verbal Reasoning and Quantitative Reasoning sections may appear in any order after the essay.
4. The test is taken on a computer, and test-takers are provided with scratch paper or a small whiteboard for notes.
5. The Quantitative Reasoning section includes an on-screen calculator.
6. There are no breaks during the test. Leaving your seat at any point will not stop the timer for the current section.

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1. If $3x + 2 = 11$, what is the value of x?

(A) 5
(B) 3
(C) 4
(D) 2 **Correct Answer:** (2) 3
Solution: Step 1: Subtract 2 from both sides of the equation:

$$3x + 2 - 2 = 11 - 2 \quad \Rightarrow \quad 3x = 9.$$

Step 2: Divide both sides by 3:

$$\frac{3x}{3} = \frac{9}{3} \quad \Rightarrow \quad x = 3.$$

Quick Tip

To solve linear equations, isolate the variable by performing inverse operations such as addition/subtraction and multiplication/division.

2. The average (arithmetic mean) of 5, 10, 15, and 20 is:

(A) 12.5
(B) 15
(C) 10
(D) 13 **Correct Answer:** (1) 12.5
Solution: Step 1: Add the numbers:

$$5 + 10 + 15 + 20 = 50.$$

Step 2: Divide the sum by the number of values (4):

$$\frac{50}{4} = 12.5.$$

Quick Tip

To find the arithmetic mean, add all the numbers together and divide by the total count of the numbers.

3. If a car travels 150 miles in 2.5 hours, what is the average speed in miles per hour?

(A) 50 miles per hour
(B) 55 miles per hour
(C) 60 miles per hour
(D) 65 miles per hour **Correct Answer:** (3) 60 miles per hour
Solution: Step 1: Divide the total distance by the total time:

$$\frac{150}{2.5} = 60.$$

Thus, the average speed is 60 miles per hour.

Quick Tip

To calculate average speed, divide the total distance by the total time taken.

4. Solve for y: $2y - 7 = 3y + 4$.
(A) -11
(B) 11
(C) -7
(D) 7 **Correct Answer:** (1) -11
Solution: Step 1: Subtract $2y$ from both sides:

$$2y - 7 - 2y = 3y + 4 - 2y \quad \Rightarrow \quad -7 = y + 4.$$

Step 2: Subtract 4 from both sides:

$$-7 - 4 = y + 4 - 4 \quad \Rightarrow \quad y = -11.$$

Quick Tip

When solving linear equations, isolate the variable by performing inverse operations like addition/subtraction or multiplication/division.

6. If $f(x) = x^2 - 3x + 2$, find $f(2)$.
(A) 0
(B) 2
(C) -2
(D) 4 **Correct Answer:** (1) 0
Solution: Step 1: Substitute 2 for x in the function:

$$f(2) = 2^2 - 3(2) + 2 = 4 - 6 + 2 = 0.$$

Thus, $f(2) = 0$.

Quick Tip

To evaluate a function at a specific value of x, substitute the value of x into the expression and simplify.

7. Expand the expression $(x + 3)(x - 2)$.
(A) $x^2 + x - 6$
(B) $x^2 - x - 6$
(C) $x^2 + 6x - 6$
(D) $x^2 - 6x - 6$ **Correct Answer:** (1) $x^2 + x - 6$
Solution: Step 1: Use the distributive property:

$$(x + 3)(x - 2) = x(x - 2) + 3(x - 2) = x^2 - 2x + 3x - 6.$$

Step 2: Combine like terms:

$$x^2 - 2x + 3x - 6 = x^2 + x - 6.$$

Thus, the expanded form is $x^2 + x - 6$.

Quick Tip

To expand binomials, use the distributive property (also known as FOIL for two binomials): Multiply each term in the first binomial by each term in the second binomial.

8. If $x^2 = 16$, what are the possible values of x?
(A) 4
(B) -4
(C) 4 or -4
(D) 0 **Correct Answer:** (3) 4 or -4
Solution: Step 1: Take the square root of both sides:

$$x^2 = 16 \quad \Rightarrow \quad x = \pm 4.$$

Thus, the possible values of x are 4 or -4.

Quick Tip

When solving equations with squared terms, remember to take both the positive and negative square roots.

9. What is the area of a triangle with a base of 8 cm and a height of 5 cm?
(A) $20\,\text{cm}^2$
(B) $30\,\text{cm}^2$
(C) $40\,\text{cm}^2$
(D) $10\,\text{cm}^2$ **Correct Answer:** (1) $20\,\text{cm}^2$
Solution: Step 1: Use the formula for the area of a triangle:

$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}.$$

Step 2: Substitute the given values:

$$\text{Area} = \frac{1}{2} \times 8 \times 5 = 20\,\text{cm}^2.$$

Thus, the area of the triangle is $20\,\text{cm}^2$.

Quick Tip

To find the area of a triangle, use the formula $\frac{1}{2} \times \text{base} \times \text{height}$.

10. What is the circumference of a circle with a radius of 7 cm?
(A) 43.96 cm
(B) 44.96 cm
(C) 40.96 cm
(D) 38.96 cm **Correct Answer:** (1) 43.96 cm
Solution: Step 1: Use the formula for the circumference of a circle:

$$C = 2\pi r.$$

Step 2: Substitute the given radius $r = 7\,\text{cm}$ and $\pi \approx 3.14$:

$$C = 2 \times 3.14 \times 7 = 43.96\,\text{cm}.$$

Thus, the circumference of the circle is 43.96 cm.

Quick Tip

To find the circumference of a circle, use the formula $C = 2\pi r$, where r is the radius.

11. Find the length of the hypotenuse of a right triangle with legs of length 6 cm and 8 cm.
(A) 12 cm

(B) 10 cm
(C) 8 cm
(D) 6 cm **Correct Answer:** (2) 10 cm
Solution: Step 1: Use the Pythagorean theorem:

$$a^2 + b^2 = c^2,$$

where $a = 6\,\text{cm}$, $b = 8\,\text{cm}$, and c is the length of the hypotenuse.
Step 2: Substitute the values:

$$6^2 + 8^2 = c^2 \quad \Rightarrow \quad 36 + 64 = c^2 \quad \Rightarrow \quad 100 = c^2.$$

Step 3: Take the square root of both sides:

$$c = \sqrt{100} = 10\,\text{cm}.$$

Thus, the length of the hypotenuse is 10 cm.

Quick Tip

To find the length of the hypotenuse in a right triangle, use the Pythagorean theorem: $a^2 + b^2 = c^2$.

12. What is the volume of a cylinder with a radius of 3 cm and a height of 5 cm?
(A) $141.3\,\text{cm}^3$
(B) $120.5\,\text{cm}^3$
(C) $135.5\,\text{cm}^3$
(D) $150.5\,\text{cm}^3$ **Correct Answer:** (1) $141.3\,\text{cm}^3$
Solution: Step 1: Use the formula for the volume of a cylinder:

$$V = \pi r^2 h.$$

Step 2: Substitute the given values $r = 3\,\text{cm}$ and $h = 5\,\text{cm}$, and $\pi \approx 3.14$:

$$V = 3.14 \times 3^2 \times 5 = 3.14 \times 9 \times 5 = 141.3\,\text{cm}^3.$$

Thus, the volume of the cylinder is $141.3\,\text{cm}^3$.

Quick Tip

To find the volume of a cylinder, use the formula $V = \pi r^2 h$, where r is the radius and h is the height.

13. The mean of five numbers is 8. If four of the numbers are 7, 9, 12, and 5, what is the fifth number?
(A) 7
(B) 8
(C) 9
(D) 10 **Correct Answer:** (1) 7

Solution: Step 1: Let the fifth number be x. Then, the mean of the five numbers is given by:

$$\frac{7+9+12+5+x}{5} = 8.$$

Step 2: Simplify the equation:

$$\frac{33+x}{5} = 8.$$

Step 3: Multiply both sides by 5:

$$33 + x = 40.$$

Step 4: Subtract 33 from both sides:

$$x = 7.$$

Thus, the fifth number is 7.

Quick Tip

To find a missing number when the mean is given, set up the equation for the mean, substitute the known values, and solve for the unknown number.

14. A survey of 200 people found that 120 like coffee, 150 like tea, and 80 like both. How many people do not like either coffee or tea?
(A) 10
(B) 20
(C) 30
(D) 40 **Correct Answer:** (1) 10
Solution: Step 1: Use the principle of inclusion and exclusion. The total number of people who like either coffee, tea, or both is:

$$120 + 150 - 80 = 190.$$

Step 2: Subtract this from the total number of people surveyed:

$$200 - 190 = 10.$$

Thus, 10 people do not like either coffee or tea.

Quick Tip

To solve problems involving sets, use the principle of inclusion and exclusion to avoid double-counting the people who like both coffee and tea.

15. A dataset contains the numbers 5, 7, 9, 11, and 13. What is the median?
(A) 7
(B) 9
(C) 11
(D) 13 **Correct Answer:** (2) 9
Solution: Step 1: The median is the middle number in a sorted list. The given dataset is already sorted:

$$5, 7, 9, 11, 13.$$

Step 2: The middle number is 9, which is the third number in the list. Thus, the median is 9.

Quick Tip

To find the median of a dataset, first sort the numbers in increasing order. If there is an odd number of numbers, the median is the middle value.

16. A jar contains 4 red, 5 blue, and 6 green marbles. If one marble is picked at random, what is the probability it is blue?
(A) $\frac{1}{3}$
(B) $\frac{5}{15}$
(C) $\frac{4}{15}$
(D) $\frac{2}{5}$ **Correct Answer:** (1) $\frac{1}{3}$
Solution: Step 1: The total number of marbles is:

$$4 + 5 + 6 = 15.$$

Step 2: The probability of picking a blue marble is:

$$\frac{5}{15} = \frac{1}{3}.$$

Thus, the probability of picking a blue marble is $\frac{1}{3}$.

Quick Tip

To calculate probability, divide the number of favorable outcomes (blue marbles) by the total number of possible outcomes (total marbles).

17. Simplify the expression: $3(x - 2) + 4$**.**
(A) $3x - 2$
(B) $3x + 2$
(C) $3x - 4$
(D) $3x + 4$ **Correct Answer:** (1) $3x - 2$
Solution: Step 1: Distribute the 3 over the expression $(x - 2)$:

$$3(x - 2) = 3x - 6.$$

Step 2: Add the constant term 4 to the expression:

$$3x - 6 + 4 = 3x - 2.$$

Thus, the simplified expression is $3x - 2$.

Quick Tip

To simplify an expression, distribute the constant and combine like terms.

18. If x is directly proportional to y and $x = 10$ when $y = 2$, what is x when $y = 8$?
(A) 30

(B) 40
(C) 50
(D) 60 **Correct Answer:** (2) 40
Solution: Step 1: Since x is directly proportional to y, we can write the equation:

$$x = ky,$$

where k is the constant of proportionality.
Step 2: Use the given values $x = 10$ and $y = 2$ to find k:

$$10 = k \times 2 \quad \Rightarrow \quad k = 5.$$

Step 3: Now, when $y = 8$, substitute $k = 5$ into the equation:

$$x = 5 \times 8 = 40.$$

Thus, $x = 40$.

Quick Tip

For direct proportionality, use the formula $x = ky$, and solve for k using known values. Then use this value of k to find the unknown x.

19. If $2x + 3 = 9$, what is the value of x?
(A) 1
(B) 2
(C) 3
(D) 4 **Correct Answer:** (3) 3
Solution: Step 1: Start with the given equation:

$$2x + 3 = 9.$$

Step 2: Subtract 3 from both sides:

$$2x = 6.$$

Step 3: Divide both sides by 2:

$$x = 3.$$

Thus, the value of x is 3.

Quick Tip

To solve for x in a linear equation, isolate the variable by performing inverse operations (subtraction or division) on both sides of the equation.

20. A right triangle has one leg of 5 cm and a hypotenuse of 13 cm. What is the length of the other leg?
(A) 10 cm
(B) 12 cm
(C) 15 cm
(D) 14 cm **Correct Answer:** (2) 12 cm

Solution: Step 1: Use the Pythagorean theorem. Let the length of the other leg be x. According to the Pythagorean theorem:

$$5^2 + x^2 = 13^2.$$

Step 2: Simplify the equation:

$$25 + x^2 = 169.$$

Step 3: Subtract 25 from both sides:

$$x^2 = 144.$$

Step 4: Take the square root of both sides:

$$x = 12.$$

Thus, the length of the other leg is 12 cm.

Quick Tip

Use the Pythagorean theorem $a^2 + b^2 = c^2$ to find the missing side of a right triangle, where a and b are the legs and c is the hypotenuse.