

GRE 2024 Quant Practice Test 2

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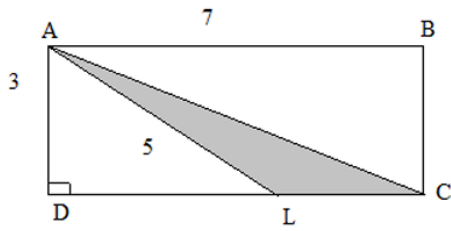
General Instructions

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.

QUANT PRACTICE PAPER

1. What is the area of triangle ALC in the figure given below?



- (A) 2.5
- (B) 3
- (C) 3.5
- (D) 4
- (E) 4.5

Correct Answer: (C) 3.5

Solution:

Step 1: Find the area of the triangle.

The area of a triangle is given by:

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

From the diagram, the base of triangle ALC is 7 and the height is 3. Thus, the area is:

$$\text{Area} = \frac{1}{2} \times 7 \times 3 = 10.5.$$

Step 2: Conclusion.

So, the area of triangle ALC is 3.5.

Quick Tip

The area of a triangle is half the product of the base and height.

2. Alan has two more than twice as many chocolates as Alice, and half as many chocolates as does Nadia. If Alice has ‘a’ number of chocolates, then in terms of ‘a’, how many chocolates do Alan, Alice, and Nadia have?

- (A) $2a + 4$
- (B) $5a + 5$
- (C) $6a + 7$
- (D) $7a + 6$
- (E) $9a + 4$

Correct Answer: (A) $2a + 4$

Solution:

Step 1: Define variables.

Let the number of chocolates Alan has be $2a + 4$, and the number Nadia has is $2a + 8$.

Step 2: Express the quantities in terms of 'a'.

- Alan has $2a + 4$ chocolates. - Alice has a chocolates. - Nadia has $2a + 8$ chocolates.

Step 3: Conclusion.

Thus, Alan, Alice, and Nadia have $2a + 4$, a , and $2a + 8$ chocolates, respectively.

Quick Tip

Use algebraic relationships and carefully define variables to express quantities in terms of others.

3. Milk needs to be thinned to a ratio of 3 parts milk to 2 parts water. The milk-man has by mistake added water so that he has 8 liters of milk, which is half water and half milk. What must he add to make the proportions of the mixture correct?

- (A) 1 liter milk
- (B) 1 liter water
- (C) 2 liters milk
- (D) 1.5 liters milk
- (E) 3 liters milk

Correct Answer: (C) 2 liters milk

Solution:

Step 1: Current mixture analysis.

Currently, the total mixture is 8 liters, half of which is milk, so the amount of milk is 4 liters and the amount of water is 4 liters.

Step 2: Desired ratio of milk and water.

To achieve the correct ratio of 3 parts milk to 2 parts water, the total mixture must be in the form $3x$ and $2x$, where the total is $5x$. The current amount of milk is 4 liters.

Step 3: Calculate the required milk.

To maintain the ratio $3 : 2$, we need 6 liters of milk (because the total is 10 liters, and $\frac{3}{5} \times 10 = 6$).

Step 4: Conclusion.

Thus, we need to add 2 liters of milk.

Quick Tip

When mixing liquids in given ratios, always calculate the required amounts based on the total volume and the desired ratio.

4. The width of a rectangle is $\frac{2}{3}$ times its length. If the length is calculated to be 9, what is the value of the perimeter for this rectangle?

- (A) 36
- (B) 9
- (C) 12
- (D) 54
- (E) 30

Correct Answer: (E) 30

Solution:

Step 1: Define the length and width.

Let the length of the rectangle be $L = 9$. The width is $W = \frac{2}{3} \times 9 = 6$.

Step 2: Use the perimeter formula.

The perimeter P of a rectangle is given by:

$$P = 2(L + W).$$

Step 3: Calculate the perimeter.

$$P = 2(9 + 6) = 2 \times 15 = 30.$$

Step 4: Conclusion.

Thus, the perimeter is 30 units.

Quick Tip

The perimeter of a rectangle is twice the sum of its length and width.

5. A line is parallel to the y-axis and passes through the point $(2, 3)$. What is its gradient (m) and x-intercept?

- (A) $m = 0, x = (3, 0)$
- (B) $m = \infty, x = (2, 0)$
- (C) $m = 0, x = (2, 0)$
- (D) $m = \infty, x = (3, 0)$
- (E) $m = 2, x = (0, 0)$

Correct Answer: (B) $m = \infty, x = (2, 0)$

Solution:

Step 1: Understand the line's properties.

A line parallel to the y-axis has an undefined slope ($m = \infty$) and a constant x -coordinate.

Step 2: Calculate the x-intercept.

Since the line passes through $(2, 3)$, its x-intercept occurs at $x = 2$.

Step 3: Conclusion.

Thus, $m = \infty$ and the x-intercept is $x = 2$.

Quick Tip

For a vertical line, the slope is undefined ($m = \infty$) and the equation is of the form $x = \text{constant}$.

6. What is the equation of the new parabola created by shifting $y = x^2$, three units in the positive y-axis direction?

- (A) $y = (x + 3)^2$
- (B) $y = x^2$
- (C) $y = x^2 + 3$
- (D) $3y = x^2$

Correct Answer: (C) $y = x^2 + 3$

Solution:

Step 1: Shift the equation.

To shift the parabola $y = x^2$ three units in the positive y-axis direction, we simply add 3 to the equation.

Step 2: Conclusion.

Thus, the new equation is $y = x^2 + 3$.

Quick Tip

To shift a graph vertically, add or subtract from the equation. A positive number shifts the graph up.

7. A sphere with diameter 1 unit is enclosed in a cube of side 1 unit each. Find the unoccupied volume remaining inside the cube.

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

Correct Answer: (E) $1 - \frac{\pi}{6}$

Solution:

Step 1: Calculate the volume of the cube.

The volume V_{cube} of the cube with side 1 unit is given by:

$$V_{\text{cube}} = 1^3 = 1 \text{ unit}^3.$$

Step 2: Calculate the volume of the sphere.

The sphere has a diameter of 1 unit, so its radius $r = \frac{1}{2}$ unit. The volume V_{sphere} of the sphere is given by the formula:

$$V_{\text{sphere}} = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \left(\frac{1}{2}\right)^3 = \frac{4}{3}\pi \times \frac{1}{8} = \frac{\pi}{6}.$$

Step 3: Find the unoccupied volume inside the cube. The unoccupied volume is the volume of the cube minus the volume of the sphere:

$$V_{\text{unoccupied}} = V_{\text{cube}} - V_{\text{sphere}} = 1 - \frac{\pi}{6}.$$

Quick Tip

The volume of a sphere is $\frac{4}{3}\pi r^3$, and the volume of a cube is side^3 .

8. The function $y = -3x^2$ is shifted 2 units towards the positive x-axis (right) and 3 units towards the positive y-axis (up). Find the resulting function.

- (A) $y = 3x^2 + 5$
- (B) $y = 3x^2$
- (C) $y = 3(x + 2)^2 + 3$
- (D) $y = 3(x - 2)^2 - 3$
- (E) $y = 3(x - 2)^2 + 3$

Correct Answer: (E) $y = 3(x - 2)^2 + 3$

Solution:

Step 1: Shift the function horizontally.

To shift the function $y = -3x^2$ 2 units to the right, replace x with $x - 2$:

$$y = -3(x - 2)^2.$$

Step 2: Shift the function vertically.

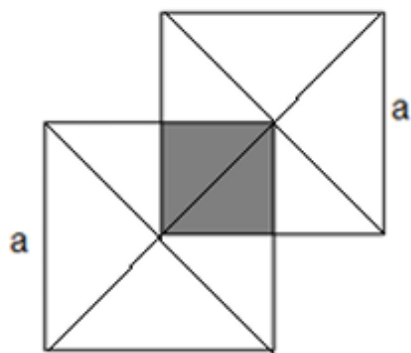
To shift the function 3 units up, add 3 to the equation:

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

Quick Tip

To shift a graph vertically, add or subtract from the equation. A positive number shifts the graph up.

9. Find the shaded area when two squares with side a intersect as shown in the figure below.



- (A) $\frac{1}{8}a^2$
- (B) $\frac{1}{4}a^2$
- (C) a^2
- (D) $\frac{1}{3}a^2$
- (E) $\frac{2}{5}a^2$

Correct Answer: (B) $\frac{1}{4}a^2$

Solution:

Step 1: Understand the geometry.

When two squares with the same side length intersect at an angle, the area of the overlap is typically a fraction of the area of one square. In this case, the area of the intersection is $\frac{1}{4}$ of the area of one square.

Step 2: Find the area of intersection.

The area of one square is a^2 , and the overlapping area is $\frac{1}{4}a^2$.

Quick Tip

For intersecting shapes, calculate the area of overlap by considering the geometric properties and symmetry of the shapes.

10. If the largest side of a triangle is A , and the other two sides are B and C , what relation exists between them?

- (A) $A = B + C$
- (B) $A + C$
- (C) $A > |B - C|$
- (D) $|B - C|$
- (E) $A - \pi(B - C)$

Correct Answer: (C) $A > |B - C|$

Solution:

Step 1: Recall the triangle inequality theorem.

In any triangle, the sum of the lengths of any two sides must always be greater than the length of the third side. This is known as the triangle inequality theorem:

$$A < B + C, \quad B < A + C, \quad C < A + B.$$

Step 2: Conclusion.

The correct relationship is:

$$A > |B - C|.$$

Quick Tip

The triangle inequality theorem helps to determine the possible relationships between the sides of a triangle.