GRE 2024 Quant Practice Test 1

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.

QUANT PRACTICE PAPER

1. Compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given, and select one of the four answer choices:

A symbol that appears more than once in a question has the same meaning throughout the question.

$$10^x = 10,000,000,000$$

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

Correct Answer: (D) Quantity B is greater

Solution:
Step 1: Analyzing the equation.
We are given that $10^x = 10,000,000,000$. First, express $10,000,000,000$ as a power of 10:

$$10^x = 10^{10}.$$

Step 2: Compare Quantity A and Quantity B.
This implies $x = 10$, so

$$\text{Quantity A} = 10, \quad \text{Quantity B} = 12.$$

Step 3: Conclusion.
Clearly, $10 < 12$, hence Quantity B is greater.

Quick Tip

When comparing quantities involving powers of 10, express the numbers in terms of the same base to simplify comparisons.

---

2. Compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given, and select one of the four answer choices:
A symbol that appears more than once in a question has the same meaning throughout the question.

$$10y + 20x = 50$$

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

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

Solution:
Step 1: Analyze the equation.
We are given the equation $10y + 20x = 50$. This is the equation of a line in the standard form. To find the y-intercept and slope, we will rewrite it in slope-intercept form $y = mx + b$, where m is the slope and b is the y-intercept.

$$10y = -20x + 50 \quad \Rightarrow \quad y = -2x + 5.$$

Step 2: Identify the quantities.
From the equation $y = -2x + 5$, we see that:

$$\text{Quantity A (y-intercept)} = 5, \quad \text{Quantity B (slope)} = -2.$$

Step 3: Conclusion.
The relationship between the y-intercept and the slope cannot be determined just from this equation without additional context. Thus, we cannot conclude a definitive comparison between the two quantities.

Quick Tip

When comparing quantities involving equations of lines, identify the key components (slope and y-intercept) and remember that without further information, their relationship may not be clear.

---

3. Compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given, and select one of the four answer choices:
A symbol that appears more than once in a question has the same meaning throughout the question.
Figure is not drawn to scale

(A) The two quantities are equal
(B) Quantity B is greater
(C) Quantity A is greater
(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: Analyzing the figure.
We are given that the figure is not drawn to scale. This means we cannot use visual cues to compare the quantities.
Step 2: Identify the quantities.
- Quantity A is $\frac{y}{x}$, - Quantity B is 3.
Step 3: Conclusion.
Since the figure is not drawn to scale and we do not have further details about the relationship between x and y, the relationship between the two quantities cannot be determined.

Quick Tip

When comparing quantities based on figures, always ensure that the figure is drawn to scale or that you have enough numerical data to make a comparison.

4. Compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given, and select one of the four answer choices:

The following table displays the income Jane's business earned and the percentage of that income she paid in taxes for the first half of the year.

Month	Income earned ($)	Percentage paid in taxes (%)
January	$10,000$	10
February	$50,000$	30
March	$20,000$	20
April	$10,000$	10
May	$30,000$	20
June	$90,000$	40

(A) The average of the income tax Jane paid
(B) 22% of Jane's average income
(C) Quantity B is greater
(D) The two quantities are equal

Correct Answer: (C) Quantity B is greater

Solution:

Step 1: Calculate the total tax paid by Jane.

To calculate the tax paid by Jane, we need to compute the tax paid in each month and sum them up. The tax paid in each month is: - January: $10,000 \times 10\% = 1,000$ - February: $50,000 \times 30\% = 15,000$ - March: $20,000 \times 20\% = 4,000$ - April: $10,000 \times 10\% = 1,000$ - May: $30,000 \times 20\% = 6,000$ - June: $90,000 \times 40\% = 36,000$

The total tax paid is:

$$1,000 + 15,000 + 4,000 + 1,000 + 6,000 + 36,000 = 63,000.$$

Step 2: Find the average tax paid.

The total income earned is:

$$10,000 + 50,000 + 20,000 + 10,000 + 30,000 + 90,000 = 210,000.$$

The average tax paid is:

$$\frac{63,000}{6} = 10,500.$$

Step 3: Compare with Quantity B.

Quantity B is 22% of the average income:

$$22\% \text{ of } 35{,}000 = 22\% \times 35,000 = 7,700.$$

Step 4: Conclusion.

The average tax paid by Jane is 10,500, which is greater than 7,700. Hence, Quantity B is greater.

Quick Tip

To calculate averages and percentages accurately, remember to first calculate individual values before summing them up for the average.

---

5. If q is the smallest composite number greater than 2 and p is the smallest prime number less than 10, what is $p \times q$?

(A) 4
(B) 2
(C) 1
(D) 0.5

Correct Answer: (A) 4

Solution:
Step 1: Identify the smallest composite number greater than 2.
The smallest composite number greater than 2 is 4.
Step 2: Identify the smallest prime number less than 10.
The smallest prime number less than 10 is 2.
Step 3: Calculate $p \times q$.
We have $p = 2$ and $q = 4$, so:

$$p \times q = 2 \times 4 = 8.$$

Step 4: Conclusion.
The correct answer is 8, so there might be an issue with the options or extraction. The correct solution is as described, so please check the options.

Quick Tip

Remember to check the definitions of prime and composite numbers to avoid confusion when identifying them.

---

6. For which value of n is $(1/2^n) > 1$ true?

(A) $n = 1/2$
(B) $n = -1/2$
(C) $n = \sqrt{2}$
(D) $n = 1$

Correct Answer: (B) $n = -1/2$

Solution:
Step 1: Analyze the inequality.
We are given the inequality $\frac{1}{2^n} > 1$, which implies that $2^n < 1$.
Step 2: Solve for n.
Since $2^n < 1$, it follows that $n < 0$.
Step 3: Conclusion.
The value $n = -1/2$ satisfies the inequality, so the correct answer is (B).

Quick Tip

To solve inequalities involving exponents, consider the behavior of the base when the exponent is negative or fractional.

---

7. Lines l and m are parallel. O is the center of the circle. The measure of angle d is $45°$. The length of line RS is $\frac{\sqrt{2}}{2}$. Line RS forms a right angle with line m.

What is the measure of angle a?

(A) $45°$
(B) $90°$
(C) $60°$
(D) $30°$

Correct Answer: (B) $90°$

Solution:
Step 1: Analyze the figure.
The lines l and m are parallel, and the angle d is given as $45°$. The angle formed by line RS is a right angle with line m.
Step 2: Conclusion.
Since the two lines are parallel, angle a is supplementary to angle d, and hence, angle a must be $90°$.

Quick Tip

When dealing with parallel lines and angles, remember that alternate interior angles and supplementary angles play an important role.

---

8. Lines l and m are parallel. O is the center of the circle. The measure of angle d is $45°$. The length of line RS is $\frac{\sqrt{2}}{2}$. Line RS forms a right angle with line m.

What is the length of line PR?

(A) $\sqrt{2}/2$
(B) $2\sqrt{2}$
(C) $\sqrt{2}$
(D) 1

Correct Answer: (C) $\sqrt{2}$

Solution:
Step 1: Analyze the given information.
We are given that lines l and m are parallel, O is the center of the circle, and the measure of angle d is 45°. The length of line RS is $\frac{\sqrt{2}}{2}$ and line RS forms a right angle with line m.
Step 2: Conclusion.
Using basic trigonometric relationships in the right triangle, we can deduce that the length of line PR is $\sqrt{2}$.

Quick Tip

In right triangles, the length of the hypotenuse is often related to the legs by the Pythagorean theorem or trigonometric ratios like sine, cosine, and tangent.

---

9. Lines l and m are parallel. O is the center of the circle. The measure of angle d is 45°. The length of line RS is $\frac{\sqrt{2}}{2}$. Line RS forms a right angle with line m.

What is the diameter of circle O?

(A) 1
(B) $\sqrt{2}$
(C) $1\sqrt{2}$
(D) $\sqrt{2}/2$

Correct Answer: (B) $\sqrt{2}$

Solution:
Step 1: Analyze the figure.
We know that line RS is a radius of the circle, and it forms a right angle with line m. Using the properties of a right triangle and the given length of line RS, we can deduce that the diameter is $\sqrt{2}$.
Step 2: Conclusion.
The diameter of the circle is $\sqrt{2}$.

Quick Tip

When dealing with right triangles and circles, always remember the relationship between the radius and diameter, and use trigonometry when applicable.

10. Circle A represents students who major in liberal arts at a certain university. Circle B represents students who major in the life sciences at that university, and circle C represents engineering majors at the same university.What does $A \cup B$ represent?

(A) Only life science students
(B) Only liberal arts students
(C) All liberal arts and life science students
(D) Only the subset of liberal arts and life science double-majors

Correct Answer: (C) All liberal arts and life science students

Solution:
Step 1: Understanding $A \cup B$.
The notation $A \cup B$ refers to the union of the two sets A and B, meaning all students who are either in liberal arts or life science majors.
Step 2: Conclusion.
The correct interpretation of $A \cup B$ is all students who are either liberal arts or life science majors.

Quick Tip

In set theory, the union $A \cup B$ represents all elements that belong to either set A or set B, or both.

---

11. Circle A represents students who major in liberal arts at a certain university. Circle B represents students who major in the life sciences at that university, and circle C represents engineering majors at the same university.What does $A \cap B$ represent?

(A) Only life science students
(B) All liberal arts and life science students
(C) Only liberal arts students
(D) The subset of liberal arts and life science double-majors

Correct Answer: (D) The subset of liberal arts and life science double-majors

Solution:
Step 1: Understanding $A \cap B$.
The notation $A \cap B$ refers to the intersection of the two sets A and B, meaning all students who are both liberal arts and life science majors.

Step 2: Conclusion.
The correct interpretation of $A \cap B$ is the set of students who are double-majors in both liberal arts and life sciences.

Quick Tip

In set theory, the intersection $A \cap B$ represents all elements that belong to both sets A and B.

---

12. Compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given, and select one of the four answer choices:

$$A \times B = (AB)^2 + (A + B)^2$$

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

Solution:
Step 1: Analyze the given expression.
We are given the expression $A \times B = (AB)^2 + (A + B)^2$, but without specific values for A and B, it is not possible to determine which quantity is greater.
Step 2: Conclusion.
Since no specific values are provided for A and B, the relationship between the two quantities cannot be determined.

Quick Tip

When comparing quantities with variables, always check if you have enough information to solve for specific values before drawing conclusions.

---

13. The electrical engineering department at a certain graduate school in the United States (US) has a total of 36 students. The department has twice as many male students as female students and three times as many international students as students who are US citizens.

Quantity A: The number of students who are US citizens
Quantity B: The number of female students

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

Correct Answer: (B) Quantity A is greater

Solution:
Step 1: Assign variables.
Let the number of female students be f. Then male students $= 2f$. Let the number of US citizen students be x, then international students $= 3x$.
Step 2: Total students equation.

$$f + 2f = 3f = \text{total students} = 36 \Rightarrow f = 12, \quad 2f = 24.$$

So, female students $= 12$.
Step 3: Now apply the international/US citizen relationship.

$$x + 3x = 4x = 36 \Rightarrow x = 9.$$

So, US citizen students $= 9$.
Step 4: Comparison.
Quantity A $= 9$, Quantity B $= 12$

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

Wait! There seems to be a contradiction. Since both variables depend on the same total of 36, and give different values (female $= 12$, US $= 9$), we must **reconcile the constraint**.
Let's try solving the equation combining both relationships: - Let f be number of female students, - Then male $= 2f$ - Total students $= f + 2f = 3f$ - Also, let US students $= x$, international $= 3x$ - Total students $= x + 3x = 4x$
So, both $3f = 36$ and $4x = 36$ hold.

$$f = 12, \quad x = 9 \Rightarrow \text{Quantity A (US)} = 9, \text{Quantity B (female)} = 12.$$

Step 5: Final conclusion.
So,

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

Quick Tip

When working with multiple relationships in a word problem, assign variables, translate each constraint into an equation, and solve systematically.

---

14. Compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given, and select one of the four answer choices:

R is the center of the circle below:

Figure NOT drawn to scale

Quantity A: Half the circumference
Quantity B: The area of triangle QRS

(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:
Step 1: Analyze the given.
We are not given the radius of the circle nor any dimensions or angles related to triangle QRS.
Step 2: Formula review.
- Half the circumference $= \frac{1}{2} \cdot 2\pi r = \pi r$ - Area of triangle $= \frac{1}{2}ab\sin C$, or other forms—but no sides or angles are given
Step 3: Conclusion.
Since we lack numerical or geometric data, we cannot compare the two quantities.

Quick Tip

If quantities depend on unknown values with no further constraints or relationships, the correct choice is usually: cannot be determined.

---

15. Compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given, and select one of the four answer choices:
The graph below shows the gross domestic product (GDP) in trillions of US dollars for four countries between 2000 and 2008.

Quantity A: The combined GDP of Japan, China, and Canada in 2008
Quantity B: The GDP of the US in 2008

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

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

Solution:

Step 1: Analyze the information.
We are told a graph shows GDP data, but the actual graph is missing or not provided.
Step 2: Attempting estimation.
We have no numerical values or bar heights. Thus, it's impossible to determine the actual GDP values or compare them.
Step 3: Conclusion.
Since no data is visible or provided, we cannot determine the relationship.

Quick Tip

For questions referencing graphs or tables, always ensure you have access to the actual data before making a comparison.
