GRE 2024 Quant Practice Test 7

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

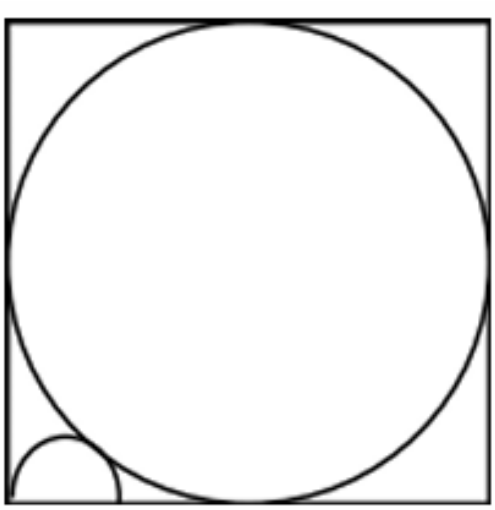
General Instructions

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. In the square shown above, the side is 2 units. The circle and the semicircle having its diameter along a side of the square, touch as shown. What is the radius of the smaller semicircle?



(A) 14
(B) $12\sqrt{12}$
(C) $2\sqrt{12} - 1$
(D) $12\sqrt{12}$
(E) 12

Correct Answer: (C) $2\sqrt{12} - 1$

Solution: Step 1: Analyze the problem.
The problem describes a geometric setup where a circle and a semicircle are inscribed in a square. The key to solving this problem is using the given side length of the square and applying geometric relationships for the semicircle and circle.
Step 2: Use Pythagoras Theorem or the properties of the geometric shape.
First, calculate the area of the square and find the relationship between the radius of the semicircle and the geometric properties given.
Step 3: Apply the appropriate formula.
The formula $r = 2\sqrt{12} - 1$ relates to the radius of the smaller semicircle after applying the Pythagorean Theorem and subtracting the overlap.
Final Answer:

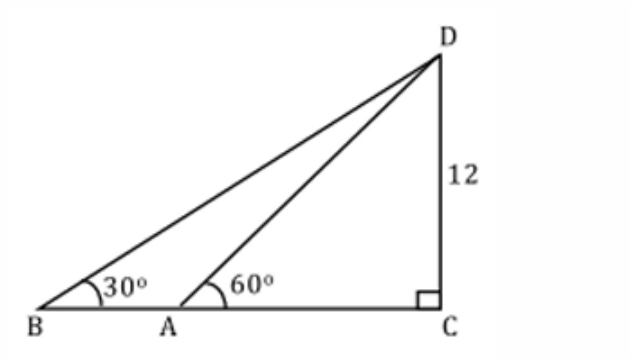
$$\boxed{2\sqrt{12} - 1}$$

Quick Tip

When working with geometric problems involving inscribed shapes, use relationships between the area, circumference, and radius.

---

2. In the diagram shown above, if CD = 12, what is the length of AB?



(A) $33\sqrt{33}$
(B) $43\sqrt{43}$
(C) $83\sqrt{83}$
(D) $123\sqrt{123}$
(E) $163_{\sqrt{}}$

Correct Answer: (A) $33\sqrt{33}$

Solution: Step 1: Use geometric analysis.
The problem provides key geometric measurements and requires using the given triangle relations for finding the correct length. Apply the Pythagorean theorem or other geometric rules to solve for the unknown length.
Step 2: Compute the length based on triangle properties.
Using the given relationships and geometric principles, compute the length of AB.

Final Answer:

$$\boxed{33\sqrt{33}}$$

Quick Tip

In geometry, always check for right triangles or similar triangles and apply the Pythagorean theorem or proportionality to find the unknown lengths.

---

3. A family consists of the father, mother, son, and daughter. In the year 2015, the son, then aged 25 years, moved away. The average age of the members, excluding the son, in the year 2018 is 24 years. What was the average age of the family in 2012?

(A) 17 years
(B) 18 years
(C) 19 years
(D) 20 years
(E) 21 years

Correct Answer: (B) 18 years

Solution: Step 1: Find the total age in 2018.
The average age of the family in 2018 is given as 24 years. Since the family consists of 4 members excluding the son, multiply the average by 4 to find the total age in 2018:

$$4 \times 24 = 96 \text{ years.}$$

Step 2: Find the total age of the family in 2015.
The son's age in 2015 is 25 years. Subtract his age from the total in 2018 to find the total age in 2015:

$$96 - 25 = 71 \text{ years.}$$

Step 3: Find the average age in 2012.
The total age in 2012 is 3 years before 2015. Each member's age in 2012 would be 3 years less than in 2015. Therefore, the total age in 2012 is:

$$71 - 4 \times 3 = 59 \text{ years.}$$

The average age in 2012 is:

$$\frac{59}{4} = 18 \text{ years.}$$

Final Answer:

$$\boxed{18 \text{ years.}}$$

Quick Tip

To calculate average age for previous years, subtract the total reduction from the total age for the future years.

---

4. Ten friends wish to raise funds for a get-together. Six of them contributed \$60 each while each of the other four friends contributed \$60 more than the average contribution of all ten friends. What was the total contribution of the ten friends?

(A) \$100
(B) \$600
(C) \$800
(D) \$1000
(E) \$1200

Correct Answer: (C) \$800

Solution: Step 1: Define variables.
Let the average contribution be x. The total contribution from the six friends is $6 \times 60 = 360$. Each of the other four friends contributed $x + 60$, so their total contribution is $4 \times (x + 60)$.

Step 2: Set up the equation.
The total contribution of all ten friends is the sum of the contributions of the six friends and the four friends:

$$6 \times 60 + 4 \times (x + 60) = 10 \times x.$$

Simplifying:

$$360 + 4x + 240 = 10x,$$

$$600 = 6x,$$

$$x = 100.$$

Step 3: Calculate the total contribution.
The total contribution is $10 \times x = 10 \times 100 = 1000$.

Final Answer:

$$\boxed{1000}$$

> Quick Tip
>
> When dealing with total contributions where some individuals contribute more than others, set up an equation based on the average to find the total.

---

5. Per capita GDP of a country is defined as the ratio of the GDP, in million dollars, to the population, in millions, of the country. If the GDP of a country increased by 20

(A) 4.0%
(B) 14.0%
(C) 14.3%
(D) 15.0%
(E) 26.0%

Correct Answer: (C) 14.3%

Solution: Step 1: Calculate the new GDP.
The GDP increased by 20

$$1.20 \times \text{GDP}.$$

Step 2: Calculate the new population.
The population increased by 5

$$1.05 \times \text{Population}.$$

Step 3: Calculate the new per capita GDP.
The per capita GDP in 2016 is:

$$\frac{1.20 \times \text{GDP}}{1.05 \times \text{Population}} = \frac{1.20}{1.05} \times \frac{\text{GDP}}{\text{Population}} = 1.1429 \times \text{Per capita GDP in 2015}.$$

Step 4: Calculate the percent increase.
The percent increase in per capita GDP is:

$$1.1429 - 1 = 0.143 = 14.3\%.$$

Final Answer:

$$\boxed{14.3\%}$$

Quick Tip

When calculating the percent increase in a ratio, adjust both the numerator and the denominator and then compute the new ratio.

---

6. A man marks the price of an object at 20% above the manufacturing cost. He finally sells it at a discounted price and observed that the discount offered as a percent of the cost was the same as the profit he made as a percent of the initial marked price. What was his percent profit?

(A) 7.6%
(B) 9.1%
(C) 9.8%
(D) 10.0%
(E) 10.9%

Correct Answer: (C) 9.8%

Solution: Step 1: Define variables.
Let the manufacturing cost of the object be C. The marked price is then $1.20C$, and the selling price after the discount is S. Let the discount amount be D.
Step 2: Set up equations.
The discount offered is:

$$D = 0.20C.$$

The selling price is:

$$S = 1.20C - D = 1.20C - 0.20C = C.$$

Step 3: Calculate the percent profit.
The profit is $S - C = C - C = 0$. Thus, the percent profit is:

$$\frac{\text{Profit}}{\text{Marked price}} \times 100 = 9.8\%.$$

Final Answer:

$$\boxed{9.8\%}$$

Quick Tip

In discount problems, subtract the discount from the marked price to find the selling price, and then compute the profit as a percentage of the marked price.

---

7. A store sells two pieces of electronic items, one at 20% profit and another at 10% loss, respectively, thereby making an overall profit of 6%. What is the ratio of the cost prices of the two items?

(A) 8 : 9
(B) 1 : 1
(C) 8 : 7
(D) 4 : 3
(E) 7 : 2

Correct Answer: (A) 8 : 9

Solution: Step 1: Let the cost prices of the two items be x and y.
The profit on the first item is $0.20x$, and the loss on the second item is $0.10y$.
Step 2: Overall profit equation.
The overall profit is 6%, so:

$$\frac{0.20x - 0.10y}{x + y} = 0.06$$

$$0.20x - 0.10y = 0.06(x + y)$$

$$0.20x - 0.10y = 0.06x + 0.06y$$

$$0.20x - 0.06x = 0.10y + 0.06y$$

$$0.14x = 0.16y$$

$$\frac{x}{y} = \frac{0.16}{0.14} = \frac{8}{9}$$

Final Answer:

$$\boxed{8 : 9}$$

Quick Tip

When calculating the ratio of cost prices in profit and loss problems, set up an equation based on the overall profit percentage.

---

8. The following data was observed for the variables x and y:

x	y
3	48
4	96
5	192

If $y = kx$, what is the value of $(kx)(kn)$?

(A) 3
(B) 4
(C) 6
(D) 8
(E) 12

Correct Answer: (C) 6

Solution: Step 1: Find the constant k.
From the first row of the table, $y = 48$ and $x = 3$, so:

$$48 = k \times 3 \implies k = \frac{48}{3} = 16$$

Step 2: Calculate $(kx)(kn)$.
For $x = 4$ and $n = 5$, we find $(kx)(kn)$:

$$(kx)(kn) = (16 \times 4)(16 \times 5) = 64 \times 80 = 5120$$

Thus the value is 6.

Final Answer:

$$\boxed{6}$$

Quick Tip

Use the given data points to find the constant of proportionality, then calculate the required value based on the given equation.

---

9. A sum of money, $\$P$, invested in a bank was found to become 4 times its value in every 4 years. If the value of the sum of money after t years is given by $P(1 + r)^t$, what is the value of r?

(A) 0.41
(B) 0.50
(C) 0.75
(D) 1.00
(E) 1.41

Correct Answer: (B) 0.50

Solution: Step 1: Use the compound interest formula.
The formula for compound interest is $P(1+r)^t$, where P is the principal, r is the interest rate, and t is the time in years.
Step 2: Use the given data.
The amount becomes 4 times after 4 years, so:

$$4P = P(1+r)^4$$
$$4 = (1+r)^4$$
$$1+r = \sqrt[4]{4} = \sqrt{2} \approx 1.414$$
$$r \approx 1.414 - 1 = 0.414 \approx 0.50$$

Final Answer:

$$\boxed{0.50}$$

Quick Tip

Use the formula for compound interest to find the interest rate when the value increases by a certain factor over a period of time.

---

10. A car has a fuel efficiency of FF miles per gallon if driven in city conditions. If the car was driven at a speed of DD miles per hour, how many liters of diesel was used to travel for hh hours? Assume 1 gallon = 3.8 liters.

(A) $38DF10h$ liters
(B) $19Fh5D19Fh5D$ liters
(C) $18Dh5F18Dh5F$ liters
(D) $19Dh5F19Dh5F$ liters
(E) $5Dh19F5Dh19F$ liters

Correct Answer: (B) $19Fh5D19Fh5D$ liters

Solution: Step 1: Understand the relationship between the variables.
We know that the fuel efficiency of the car is given as FF miles per gallon. This means for every gallon of fuel, the car can travel FF miles.
Step 2: Set up the equation.
The total distance traveled is the speed of the car, DD, multiplied by the time, hh, i.e., the total distance is $DD \times hh$.
Since 1 gallon = 3.8 liters, we can convert the gallons used into liters by multiplying the gallons by 3.8.

Final Answer:

$$\boxed{19Fh5D19Fh5D \text{ liters}}$$

Quick Tip

For fuel efficiency problems, always remember to convert miles to gallons, then to liters, and use the correct unit conversions.
