GRE Quantitative Reasoning

Sample Paper 09

A) Subject: Quantitative Reasoning **B) Total Questions:** 27 Questions (Section I: 12 — Section II: 15)

C) Time Allowed: 47 Minutes

- **Section 1:** 12 Questions — 21 Minutes
- **Section 2:** 15 Questions — 26 Minutes

D) Marking Scheme:

- **Correct Answer:** +1 Point
- **Incorrect/Unattempted:** 0 Points (No Negative Marking)

SECTION I: QUANTITATIVE REASONING

Q1. a and b are non-zero integers.

Quantity A	**Quantity B**
$(a-b)^2$	$(a+b)^2$

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.

Q2. App X starts with 5,000 steps and adds 1,500/hr. App Y starts with 8,000 steps and adds 1,100/hr.

Quantity A	**Quantity B**
Total steps on App X after 6 hours	Total steps on App Y after 5 hours

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.

Q3. The arithmetic mean of five distinct numbers is 42. When four of these numbers are isolated, their arithmetic mean is 38.

Quantity A	**Quantity B**
The exact value of the fifth number	55

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.

Q4. n is a positive integer.

Quantity A	**Quantity B**
$n^2 + n$	The product of two consecutive

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.

Q5. Choose the answer which best simplifies the expression below:
$3m(4m - 5) + 8n - 4(2m + 3n) - mn$

A. $12m^2 - 23m - 4n - mn$

B. $12m^2 - 7m + 4n - mn$

C. $12m^2 - 23m + 4n - mn$

D. $12m^2 - 23m - 4n + mn$

E. $12m^2 - 15m - 4n - mn$

Q6. Simplify the following expression: $\sqrt{180} + \sqrt{45} - \sqrt{125}$

A. It cannot be simplified further

B. $4\sqrt{5}$

C. $\sqrt{100}$

D. 10

E. $3\sqrt{5}$

Q7. Simplify the following radical operation: $\sqrt{162} - \sqrt{50}$

A. $4\sqrt{2}$

B. 8

C. $2\sqrt{2}$

D. $\sqrt{112}$

E. $9\sqrt{2}$

Q8. College X has 3,000 students (30% walk) and College Y has 5,000 students (40% walk). How many more students walk at College Y than at College X?

A. 1,100 more

B. 1,100 fewer

C. 900 more

D. 900 fewer

E. 200 more

Q9. If x and y are both odd integers, which of the following must result in an even integer value?

A. $x \cdot y + 2$

B. $4x - 3y$

C. $x^3 + y$

D. $3x + y - 1$

E. $x(y + 4)$

Q10. Which absolute value inequality defines the interval range $-5 \leq x \leq 3$ on a standard number line?

A. $|2x + 2| \leq 8$

B. $|x + 1| \leq 4$

C. $|x - 1| \leq 4$

D. $|3x + 3| \geq 12$

E. $|x + 4| \leq 1$

Q11. Evaluate the following using scientific notation: 0.7162×10^4 [ ]

Q12. Find the square root of the decimal 0.003 and round to four decimal places. [ ]

SECTION II: QUANTITATIVE REASONING

Q1. $x > y > 1$

Quantity A	**Quantity B**
x^y	y^x

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.

Q2. k is a prime number such that $20 < k < 30$.

Quantity A	**Quantity**
The number of possible values for k	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.

Q3. A rectangle has a length L and a width W. The area is 48.

Quantity A
The perimeter of the rectangle

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.

Q4. Let A represent a sequence $(a_1, a_2, \dots)$ where each term after the first is $a_n = 3a_{n-1} - 5$. If $a_2 + a_4 = 46$, what is a_1?

A. 2.86

B. 3.86

C. 4.86

D. 5.86

E. 6.86

Q5. An art curator organizes a 3-painting exhibition from a collection of 20. Two spotlights are picked from 7 colors, but 1 specific color is mandatory. How many unique exhibition combinations are possible?

A. 6,840

B. 11,400

C. 1,140

D. 3,420

E. 2,025

Q6. Engine Component K costs \$80 at 20 units/hr. Every 5 unit/hr increase raises unit cost by 10%. To produce 30 units/hr, what is the minimum price for a 30% profit margin?

A. \$125.84

B. \$114.40

C. \$121.22

D. \$128.96

E. \$104.00

Q7. A tube holds 18 engineering schematics (9 Phase A, 9 Phase B). If 2 are pulled at random without replacement, what is the probability they will NOT both be Phase B?

A. 4/17

B. 13/17

C. 1/4

D. 15/17

E. 9/17

Data Interpretation: Quarterly Tech Sales

Product	Q1 Sales (\$)	Q2 Sales (\$)	Unit Price (\$)
Laptops	150,000	180,000	1,000
Tablets	80,000	60,000	400
Monitors	40,000	55,000	200

Q8. Which product had the largest percentage increase in sales revenue from Q1 to Q2?

A. Laptops

B. Tablets

C. Monitors

D. Laptops and Monitors

E. None

Q9. How many total units of Monitors were sold during Q2? ☐

Q10. In Q1, Tablet sales revenue represented what percent of the total revenue for all three products?

A. 15%

B. 22.5%

C. 29.6%

D. 35.2%

E. 40%

Q11. A line passes through $(1, 2)$ and $(4, 11)$. What is the slope of this line? ☐

Q12. If x is 40% of y and y is 50% of 120, what is the value of x?

A. 12

B. 24

C. 30

D. 48

E. 60

Q13. A bag contains 6 red, 4 blue, and 2 green balls. If one ball is picked at random, what is the probability that it is NOT red?

A. 1/4

B. 1/3

C. 1/2

D. 2/3

E. 5/6

Q14. A rectangular rug has an area of 120 square feet and a perimeter of 46 feet. What is the length of the shorter side? ☐

Q15. If $2^n \times 2^3 = 64$, then $n^2 =$

A. 4

B. 9

C. 16

D. 25

E. 36

Solutions - Section I

1. **(D)** If a and b have the same sign, $(a+b)^2 > (a-b)^2$. If they have opposite signs, $(a-b)^2 > (a+b)^2$.
2. **(A)** App X: $5000 + (6 \times 1500) = 14000$. App Y: $8000 + (5 \times 1100) = 13500$.
3. **(A)** Total sum $(5) = 42 \times 5 = 210$. Sum $(4) = 38 \times 4 = 152$. 5th number $= 210 - 152 = 58$. $58 > 55$.
4. **(C)** $n^2 + n = n(n+1)$, which is the definition of the product of two consecutive integers.
5. **(A)** $12m^2 - 15m + 8n - 8m - 12n - mn = 12m^2 - 23m - 4n - mn$.
6. **(B)** $6\sqrt{5} + 3\sqrt{5} - 5\sqrt{5} = 4\sqrt{5}$.
7. **(A)** $9\sqrt{2} - 5\sqrt{2} = 4\sqrt{2}$.
8. **(A)** College Y: $0.4 \times 5000 = 2000$. College X: $0.3 \times 3000 = 900$. $2000 - 900 = 1100$.
9. **(C)** x^3 is odd, y is odd. Odd + Odd = Even.
10. **(B)** Midpoint is -1, distance is 4. $|x - (-1)| \leq 4 \rightarrow |x+1| \leq 4$.
11. **7162** $(0.7162 \times 10000 = 7162)$.
12. **0.0548** $(\sqrt{0.003} \approx 0.05477\ldots)$.

Solutions - Section II

1. **(D)** If $x = 3, y = 2$, $3^2 = 9 > 2^3 = 8$. If $x = 4, y = 2$, $4^2 = 16 = 2^4 = 16$. If $x = 5, y = 2$, $5^2 = 25 < 2^5 = 32$.
2. **(C)** Prime numbers between 20 and 30 are 23 and 29. There are exactly 2 values.
3. **(D)** If $L = 8, W = 6$, $P = 28$ (Equal). If $L = 12, W = 4$, $P = 32$ (A is greater).
4. **(B)** $a_2 = 3a_1 - 5$; $a_4 = 27a_1 - 65$. $(3a_1 - 5) + (27a_1 - 65) = 46 \rightarrow 30a_1 = 116 \rightarrow a_1 = 3.86$.
5. **(A)** $\binom{20}{3} \times \binom{6}{1} = 1140 \times 6 = 6840$.
6. **(A)** Two steps: $80 \times 1.1 \times 1.1 = 96.8$. For 30% profit: $96.8 \times 1.3 = 125.84$.
7. **(B)** $1 - P(B,B) = 1 - (9/18 \times 8/17) = 1 - 4/17 = 13/17$.
8. **(C)** Monitors: $(55 - 40)/40 = 37.5\%$. Laptops: 20%.
9. **275** $(55,000/200 = 275)$.
10. **(C)** Total revenue $= 150k + 80k + 40k = 270k$. $80/270 \approx 29.6\%$.
11. **3** $([11-2]/[4-1] = 9/3 = 3)$.

12. **(B)** $y = 60, x = 0.4 \times 60 = 24$.
13. **(C)** Red $= 6$, Non-Red $= 6$. Probability $= 6/12 = 1/2$.
14. **8** $(L \times W = 120, L + W = 23 \rightarrow 15, 8)$. Shorter side is 8.
15. **(B)** $2^n \times 2^3 = 2^6 \rightarrow n = 3.n^2 = 9$.