

GRE Sample Paper 02

A) Test Components: Analytical Writing — Verbal Reasoning — Quantitative Reasoning

B) Total Questions: 108 Questions

C) Total Time Allowed: 3 Hours 45 Minutes

- **Analytical Writing:** 2 Essays — 60 Minutes
- **Verbal Reasoning:** 2 Sections — 82 Minutes Total
- **Quantitative Reasoning:** 2 Sections — 94 Minutes Total

D) Marking Scheme:

- **Correct Answer:** +1 Point
- **Incorrect/Unattempted:** 0 Points (No Negative Marking)
- **Multi-blank/Equivalence:** No partial credit.

SECTION I: ANALYTICAL WRITING

1. Analyze an Issue (30 Minutes)

"The best way to understand the character of a society is to examine the character of the men and women that the society chooses as its heroes or role models."

2. Analyze an Argument (30 Minutes)

The following appeared in a newsletter from the marketing director of Vibrant Health, a chain of organic grocery stores.

"Last year, our main competitor, GreenLeaf Markets, started offering a subscription-based home delivery service in the city of Oakview. Since the introduction of this service, GreenLeaf's total revenue in Oakview has increased by 30 percent. During the same period, Vibrant Health's sales in Oakview have remained stagnant. Therefore, to increase our revenue and regain our competitive edge, Vibrant Health should immediately implement an identical home delivery subscription service in all of our store locations nationwide."

SECTION II: VERBAL REASONING - PART 1

Q1. The critic's review of the exhibition was unexpectedly _____; although he is known for his scathing and long-winded critiques, this assessment was both brief and complimentary.

- A. Vitriolic
- B. Laconical
- C. Garroulous
- D. Abstruse

Q2. Despite the evidence of systemic corruption, the official remained _____ in his denial, refusing to acknowledge even the most minor infractions.

- A. Vacillating
- B. Obdurate
- C. Diffident
- D. Complaisant

Q3. The researcher was noted for her (i) _____ methodology; she was able to (ii) _____ the complex data into a format that was easily understood by the public.

- A. (i) Haphazard; (ii) Confound
- B. (i) Fastidious; (ii) Elucidate
- C. (i) Capricious; (ii) Elucidate
- D. (i) Fastidious; (ii) Obfuscate

Q4. While the city's new infrastructure plan is (i) _____ in its scope, critics argue that the (ii) _____ budget makes its successful completion highly improbable.

- A. (i) Ambitious; (ii) Exiguous
- B. (i) Modest; (ii) Abundant
- C. (i) Ambitious; (ii) Prodigious
- D. (i) Trivial; (ii) Inadequate

Q5. The passage implies that the "traditional view" regarding the decline of the Mayan civilization:

- A. Is the only theory supported by recent archaeological finds.

- B. Overlooks the role of environmental factors in societal collapse.
- C. Correctly identifies warfare as the sole cause of the migration.
- D. Is essentially flawed due to a lack of carbon-dating technology.

Q6. According to the passage, the primary reason for the shift in agricultural practices was:

- A. A sudden increase in the availability of foreign labor.
- B. The depletion of soil nutrients due to intensive monocropping.
- C. A government mandate requiring the cultivation of cash crops.
- D. The introduction of more efficient irrigation systems.

Q7. The author mentions the "absence of written records" in the northern regions primarily to:

- A. Suggest that the inhabitants were largely illiterate.
- B. Highlight a challenge faced by historians studying the period.
- C. Prove that the northern tribes were less advanced than the southern ones.
- D. Explain why oral traditions are the most reliable source of data.

Q8. The board's decision to liquidate the company's assets was met with _____ by the shareholders, who had hoped for a restructuring plan.

- A. Exultation
- B. Consternation and Dismay
- C. Equanimity
- D. Approbation

Q9. The poet's imagery was considered _____ for the Victorian era, as it challenged the period's strict moral and aesthetic conventions.

- A. Banal
- B. Avant-garde and Heterodox
- C. Derivative
- D. Trite

Q10. A study found that students who hand-write notes perform 20% better on exams than those who type. Which, if true, most weakens the conclusion that handwriting improves memory?

- A. The study only included students who were already proficient in shorthand.
- B. Typing allows students to capture a higher volume of information.
- C. The students who hand-wrote notes were given 10% more time to study.
- D. Digital note-taking often leads to more frequent online distractions.

Q11. Choose the correct sentence regarding the use of the subjunctive mood:

- A. If I was you, I would accept the job offer immediately.
- B. If I were you, I would accept the job offer immediately.
- C. If I am you, I will accept the job offer immediately.
- D. If I would be you, I would accept the job offer immediately.

Q12. In the phrase "the ephemeral nature of fame," the word "ephemeral" most nearly means:

- A. Enduring
- B. Transitory
- C. Notorious
- D. Insignificant

SECTION III: VERBAL REASONING - PART 2

Q1. The professor's lectures were notoriously (i) _____; he would meander from personal anecdotes to abstruse theories without any (ii) _____ logical progression, a habit that frequently left even the most attentive students (iii) _____.

- A. (i) Discursive; (ii) Perceptible; (iii) Bewildered
- B. (i) Linear; (ii) Abrupt; (iii) Enlightened
- C. (i) Succinct; (ii) Seamless; (iii) Encouraged
- D. (i) Discursive; (ii) Tenuous; (iii) Chagrined

Q2. While the treaty was originally intended to be (i) _____, providing a final resolution to the border dispute, the (ii) _____ phrasing of the document's final clauses allowed for multiple conflicting interpretations.

- A. (i) Definitive; (ii) Equivocal
- B. (i) Tentative; (ii) Precise
- C. (i) Definitive; (ii) Lucid

D. (i) Ephemeral; (ii) Ambivalent

Q3. To the casual observer, the politician's sudden reversal on the carbon tax seemed (i) _____, yet seasoned analysts recognized it as a (ii) _____ maneuver designed to neutralize his opponent's primary platform.

- A. (i) Capricious; (ii) Shrewd
- B. (i) Principled; (ii) Reckless
- C. (i) Inevitable; (ii) Altruistic
- D. (i) Whimsical; (ii) Candid

Q4. The explorer found the ascent of the north face to be (i) _____, requiring every ounce of his endurance, but the (ii) _____ vista from the peak rendered the preceding hardships insignificant.

- A. (i) Arduous; (ii) Sublime
- B. (i) Effortless; (ii) Panoramic
- C. (i) Mundane; (ii) Obscured
- D. (i) Laborious; (ii) Mediocre

Q5. The firm's long-standing reputation for _____ was reinforced by its decision to self-report the accounting error before the annual audit.

- A. Probity and Integrity
- B. Duplicity and Guile
- C. Mendacity and Deceit
- D. Extravagance and Profligacy

Q6. The technical manual was so _____ that even the engineers who designed the system struggled to follow the diagnostic procedures.

- A. Convoluted and Tortuous
- B. Straightforward and Lucid
- C. Pithy and Succinct
- D. Manifest and Apparent

Q7. According to the passage, the Great Oxidation Event is best characterized as a "biological turning point" because:

- A. It marked the first time life adapted to an inorganic environment.

- B. Biological metabolic byproducts fundamentally altered the planet's chemistry.
- C. It led to the immediate extinction of all photosynthetic organisms.
- D. It proved that volcanic activity is the primary driver of atmospheric change.

Q8. The author uses the term "catastrophe" in the second paragraph to emphasize that the accumulation of oxygen was:

- A. A geological failure that nearly destroyed the Earth's crust.
- B. A lethal environmental shift for the then-dominant anaerobic life forms.
- C. A temporary setback that delayed the evolution of multicellular life.
- D. An unintended consequence of the depletion of atmospheric carbon.

Q9. Which of the following inferences about cyanobacteria is best supported by the passage?

- A. They were the only organisms capable of surviving the Great Oxidation Event.
- B. Their evolutionary success was hampered by the toxicity of their own waste products.
- C. They played a passive role in the transition from an anaerobic to an aerobic world.
- D. Their biological activity created conditions that facilitated the rise of complex life.

Q10. [Critical Reasoning] A study finds that urban areas with high concentrations of public parks report lower rates of respiratory illness. However, these areas also have significantly higher property taxes. Which of the following, if true, most undermines the claim that parks improve respiratory health?

- A. People with higher incomes, who live in high-tax areas, can afford better air filtration and healthcare.
- B. Public parks often contain high levels of pollen, which can exacerbate certain respiratory conditions.
- C. The study did not account for the types of trees planted in the parks.
- D. Cities with fewer parks are currently implementing new green-energy initiatives.

Q11. The ambassador was praised for being _____ during the delicate negotiations, ensuring that no party felt slighted while the interests of his own nation were protected.

- A. Tactful and Politic
- B. Brash and Impetuous
- C. Candid and Outspoken
- D. Abrasive and Churlish

Q12. The novelist's later works were criticized for being _____, filled with sprawling digressions that added little to the thematic development of the stories.

- A. Verbose and Prolix
- B. Laconic and Terse
- C. Compelling and Piquant
- D. Enigmatic and Obscure

Q13. The physicist's lecture on entropy was surprisingly _____, making a concept that usually baffles laypeople seem entirely accessible.

- A. Pellucid and Limpid
- B. Recondite and Abstruse
- C. Convoluted and Knotty
- D. Opaque and Turbid

Q14. Despite an _____ beginning to the fiscal year, the company's stock price plummeted following a series of unforeseen legal challenges in the third quarter.

- A. Auspicious and Propitious
- B. Inauspicious and Ominous
- C. Dismal and Wretched
- D. Stellar and Unprecedented

Q15. The curator's approach to the exhibit was _____, drawing from a wide array of influences ranging from Baroque sculpture to contemporary street art.

- A. Eclectic and Heterogeneous
- B. Uniform and Monolithic
- C. Dogmatic and Rigid
- D. Parochial and Insular

SECTION IV: QUANTITATIVE REASONING - PART 1

Q1. The price of a laptop was increased by 25%, and then the new price was decreased by 20%.

Quantity A	Quantity B
The final price of the laptop	The original price of the laptop

- 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. The sum of three consecutive odd integers is 129. What is the value of the largest of these three integers?

- A. 41
- B. 43
- C. 45
- D. 47
- E. 49

Q3. A square has an area of 64. A circle has a radius of 5.

Quantity A	Quantity B
The perimeter of the square	The circumference of the circle

- 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. x and y are non-zero integers.

Quantity A	Quantity B
$ x + y $	$ x + y $

- 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. If $\frac{2}{x} + \frac{1}{2x} = \frac{5}{4}$, then $x^2 =$

- A. 1
- B. 2

- C. 4
- D. 16
- E. 25

Q6. In a set of 7 consecutive integers, the median of the set is 12. What is the sum of all 7 integers?

- A. 70
- B. 77
- C. 84
- D. 91
- E. 98

Q7. A fair six-sided die is rolled twice. What is the probability that the sum of the two numbers rolled is exactly 9?

- A. $1/12$
- B. $1/9$
- C. $1/6$
- D. $1/4$
- E. $5/36$

Q8. A right triangle has a hypotenuse of length 13 and one leg of length 5. What is the area of the triangle?

- A. 30
- B. 32.5
- C. 60
- D. 65
- E. 120

Q9. If n is an even integer, which of the following must be even? (Select all that apply)

- ☐ $n^2 + 2n$
- ☐ $\frac{n}{2}$
- ☐ $(n + 1)^2 - 1$

Q10. Machine A can complete a task in 6 hours, and Machine B can complete the same task in 3 hours. How many hours will it take for both machines, working simultaneously at their respective constant rates, to complete the task?

Q11. If $3^{x-2} = 81$, what is the value of $x + 2$?

- A. 4
- B. 6
- C. 8
- D. 10
- E. 12

Q12. After a 30% discount, the sale price of a jacket is \$140. What was the original price of the jacket in dollars?

SECTION V: QUANTITATIVE REASONING - PART 2

Q1. $x > y$ and $xy \neq 0$.

Quantity A	Quantity B
$\frac{1}{x}$	$\frac{1}{y}$

- 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. n is a positive integer such that n^2 is a multiple of 8.

Quantity A	Quantity B
The remainder when n is divided by 4	0

- 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. Set S consists of the integers $\{2, 4, 6, 8, 10\}$. Set T is formed by adding the integer x to set S .

Quantity A	Quantity B
The standard deviation of set T if $x = 6$	The standard deviation of set S

- 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. A car's value depreciates by 20% in the first year and by 10% of its remaining value in the second year. What is the total percent depreciation of the car over the two-year period?

- A. 25%
- B. 28%
- C. 30%
- D. 32%
- E. 35%

Q5. Working alone at their respective constant rates, Machine A produces x units in 4 hours and Machine B produces x units in 3 hours. If both machines work together, how many hours will it take to produce $7x$ units?

- A. 6
- B. 12
- C. 15
- D. 18
- E. 21

Data Interpretation: Project Expenditure of Company Z (2020-2023)

Year	Research & Dev (\$)	Marketing (\$)
2020	150,000	50,000
2021	180,000	90,000
2022	210,000	140,000
2023	200,000	200,000

Q6. What is the ratio of Marketing expenditure to Total expenditure (R&D + Marketing) in the year 2022?

- A. 2:3
- B. 2:5
- C. 3:5
- D. 5:7
- E. 7:12

Q7. From 2020 to 2023, by what percent did the total annual expenditure increase?

- A. 50%
- B. 100%
- C. 125%
- D. 150%
- E. 200%

Q8. What was the average (arithmetic mean) annual expenditure on Marketing, in dollars, for the years in which Research & Development expenditure exceeded \$170,000?

Q9. If p and q are prime numbers such that $p > q > 2$, which of the following must be true? (Select all that apply)

- ☐ $p - q$ is even.
- ☐ pq is odd.
- ☐ $p^2 - q^2$ is a multiple of 4.

Q10. If x and y are positive integers such that $x^2 - y^2 = 17$, what is the value of $x^2 + y^2$?

Q11. A circle is inscribed in a square with a side length of s . What is the ratio of the area of the square to the area of the circle?

- A. $4 : \pi$
- B. $s : \pi$
- C. $\pi : 4$
- D. $2 : \pi$
- E. $1 : 1$

Q12. Line k in the xy -plane passes through the points $(1, 2)$ and $(3, 6)$. Line m is perpendicular to line k and passes through $(3, 6)$.

Quantity A	Quantity B
The y -intercept of line m	7.5

- 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.

Q13. A bag contains 5 red chips and 3 blue chips. If two chips are selected at random without replacement, what is the probability that both chips are the same color?

- A. $15/56$
- B. $13/28$
- C. $25/64$
- D. $1/2$
- E. $5/8$

Q14. For all numbers x , let the function f be defined by $f(x) = |x - 3|$. If $f(2k) = 7$, which of the following are possible values for k ?

- A. -2 only
- B. 5 only
- C. -2 and 5
- D. -5 and 2
- E. No such values exist

Q15. In a group of 100 consumers, 70 prefer Brand A, 50 prefer Brand B, and 20 prefer neither Brand A nor Brand B. How many consumers in the group prefer both Brand A and Brand B?

Solutions - Verbal Reasoning Section I

1. **(B)** The sentence uses the contrast word "although." The critic is usually "scathing and long-winded" (garroulous), but this review was "brief." "Laconical" (or laconic) means using few words, which fits the description of being brief.
2. **(B)** The word "Despite" indicates a contrast between the "evidence of systemic corruption" and the official's reaction. "Obdurate" means stubbornly refusing to change one's opinion or course of action, which fits his refusal to acknowledge even minor infractions.
3. **(B)** For blank (i), "fastidious" fits because it describes a methodology that is very attentive to and concerned about accuracy and detail. For blank (ii), "elucidate" means to make something clear or explain it, which matches the idea of making complex data understood by the public.
4. **(A)** For blank (i), "ambitious" describes a plan that is large in scope and requires significant effort. For blank (ii), "exiguous" means very small or inadequate; an exiguous budget would make the successful completion of an ambitious plan highly improbable.
5. **(B)** In GRE Reading Comprehension, a "traditional view" is frequently presented as being incomplete. If newer theories involve climate or agriculture, it implies the traditional view "overlooks the role of environmental factors" in the civilization's collapse.
6. **(B)** The passage suggests that intensive monocropping led to a crisis. Therefore, the "depletion of soil nutrients" is the logical primary reason provided for the necessary shift in agricultural practices.
7. **(B)** Historians rely on records to reconstruct the past. The author mentions the "absence of written records" to "highlight a challenge faced by historians," as they must rely on less certain evidence like pottery or soil samples.
8. **(B)** In Sentence Equivalence, the words must result in synonymous sentences. Shareholders who wanted restructuring but got liquidation would feel negative. "Consternation" and "dismay" both refer to feelings of anxiety or distress, typically at something unexpected.
9. **(B)** "Avant-garde" and "heterodox" both describe ideas that are new, original, and challenge established "conventions" or "orthodox" views. These are the only two words that create the same meaning in this context.
10. **(C)** The conclusion is that handwriting causes better performance. To weaken this, we find a confounding variable. If the handwriting group was "given 10 responsible for the better scores."
11. **(B)** The subjunctive mood is required for hypothetical "if" statements that are contrary to fact. In such cases, "were" is used for all subjects (e.g., "If I were you").
12. **(B)** "Ephemeral" refers to something that lasts for a very short time. In the context of fame, "transitory" is the direct synonym meaning not permanent.

Solutions - Verbal Reasoning Section II

1. (A) For blank (i), "discursive" means rambling or digressing from subject to subject, which matches "meander." For blank (ii), "perceptible" means noticeable; a lack of noticeable progression leads to blank (iii), "bewildered" (confused).
2. (A) The contrast "While... originally intended" suggests a gap between intent and reality. The intent was a "definitive" (final/conclusive) resolution, but the "equivocal" (ambiguous/open to interpretation) phrasing prevented it.
3. (A) To a "casual observer," the move seemed "capricious" (random/unpredictable). However, analysts saw the logic behind it, identifying it as a "shrewd" (clever/calculating) maneuver.
4. (A) Blank (i) must match the need for "endurance," making "arduous" (difficult/strenuous) the correct choice. Blank (ii) must explain why the hardships became "insignificant," making "sublime" (of such excellence/grandeur) the best fit.
5. (A) "Self-reporting an error" is an act of high moral character. "Probity" and "integrity" are synonyms meaning the quality of having strong moral principles and honesty.
6. (A) If even the designers "struggled to follow" the manual, it must be overly complex. "Convolutd" and "tortuous" are synonyms that describe something extremely complex and difficult to follow.
7. (B) The Great Oxidation Event is a "turning point" because the "biological metabolic byproducts" (oxygen from cyanobacteria) fundamentally changed the chemical makeup of the Earth's atmosphere.
8. (B) The "catastrophe" refers to the effect on "anaerobic life forms." For these organisms, oxygen was toxic, so the rise of oxygen was a lethal environmental shift that caused their mass extinction.
9. (D) The passage supports the idea that cyanobacteria produced the oxygen that eventually allowed for aerobic respiration. Thus, their activity "created conditions that facilitated the rise of complex life."
10. (A) The argument is that parks improve health. To undermine this, option (A) provides an alternative explanation: people in these high-tax/high-park areas are wealthier and can afford "better air filtration and healthcare," which might be the real reason for lower illness.
11. (A) An ambassador who ensures "no party felt slighted" is being "tactful" and "politic," both of which mean showing skill and sensitivity in dealing with people or difficult issues.
12. (A) Digressions that add "little to thematic development" make a book "verbose" and "prolix," both of which mean using or containing more words than are necessary.
13. (A) If a concept that usually "baffles" people is made "accessible," the lecture must have been very clear. "Pellucid" and "limpid" are synonyms meaning translucently clear.

14. (A) "Despite" signals a contrast with the "plummeting" stock price. The beginning of the year must have been positive. "Auspicious" and "propitious" both mean giving or being a sign of future success.
15. (A) An approach that draws from a "wide array of influences" (Baroque to street art) is "eclectic" and "heterogeneous," both meaning composed of elements drawn from various sources.

Solutions - Quantitative Reasoning Section I

- (C) Let original price be 100. Increase by 25% $\rightarrow$ 125. Decrease 125 by 20%: $125 - 0.20(125) = 125 - 25 = 100$. Since $100 = 100$, the quantities are equal.
- (C) Let the integers be $n - 2, n, n + 2$. Sum: $3n = 129 \Rightarrow n = 43$. The integers are 41, 43, 45. The largest of these is 45.
- (A) Square: Area $s^2 = 64 \Rightarrow s = 8$. Perimeter $= 4(8) = 32$. Circle: Circumference $= 2\pi(5) = 10\pi \approx 31.4$. Since $32 > 31.4$, Quantity A is greater.
- (D) If $x = 2, y = 3$, then $|2 + 3| = 5$ and $|2| + |3| = 5$ (Equal). If $x = 2, y = -3$, then $|2 - 3| = 1$ and $|2| + |-3| = 5$ (B is greater). The relationship is inconsistent.
- (C) Find common denominator: $\frac{4}{2x} + \frac{1}{2x} = \frac{5}{4} \Rightarrow \frac{5}{2x} = \frac{5}{4} \Rightarrow 2x = 4 \Rightarrow x = 2$. Thus, $x^2 = 4$.
- (C) For consecutive integers, Mean = Median. Sum = Mean $\times$ Number of terms $= 12 \times 7 = 84$.
- (B) Pairs that sum to 9: (3,6), (4,5), (5,4), (6,3). Total outcomes $= 6 \times 6 = 36$. Probability $= 4/36 = 1/9$.
- (A) Pythagorean theorem: $5^2 + b^2 = 13^2 \Rightarrow b = 12$. Area $= 0.5 \times \text{base} \times \text{height} = 0.5 \times 5 \times 12 = 30$.
- (A, C) n is even. $n^2 + 2n$ is even because (even + even = even). $(n + 1)^2 - 1$ is (odd² - 1) = (odd - 1) = even. $n/2$ is not always even (e.g., $2/2 = 1$).
- 2 Combined rate: $\frac{1}{6} + \frac{1}{3} = \frac{3}{6} = \frac{1}{2}$ task/hour. Time to complete $= 1/(1/2) = 2$ hours.
- (C) $3^{x-2} = 3^4 \Rightarrow x - 2 = 4 \Rightarrow x = 6$. Therefore, $x + 2 = 8$.
- 200 Let original price be x . $x(1 - 0.30) = 140 \Rightarrow 0.7x = 140 \Rightarrow x = 140/0.7 = 200$.

Solutions - Quantitative Reasoning Section II

1. **(D)** If $x = 2, y = 1, 1/2 < 1$ (B is greater). If $x = 1, y = -1, 1 > -1$ (A is greater). The relationship cannot be determined.
2. **(C)** For n^2 to be a multiple of 8, n must be a multiple of 4 (e.g., $4^2 = 16, 8^2 = 64$). Therefore, n divided by 4 always leaves a remainder of 0.
3. **(B)** Adding a value equal to the mean ($x = 6$) to a data set decreases the standard deviation because it reduces the average distance from the mean.
4. **(B)** Let value be 100. Year 1: $100 \times 0.8 = 80$. Year 2: $80 \times 0.9 = 72$. Total depreciation = $100 - 72 = 28\%$.
5. **(B)** Combined rate = $x/4 + x/3 = 7x/12$ per hour. Time for $7x$ units = $7x / (7x/12) = 12$ hours.
6. **(B)** 2022: Mkt = $140k$, Total = $210k + 140k = 350k$. Ratio = $140/350 = 2/5$.
7. **(B)** 2020 Total = $200k$. 2023 Total = $400k$. % Increase = $(400 - 200)/200 = 100\%$.
8. **143,333** Years where R&D > $170k$: 2021, 2022, 2023. Average Marketing = $(90,000 + 140,000 + 200,000)/3 = 143,333.33$.
9. **(A, B, C)** Since $p, q > 2$ are primes, they are odd. $p - q$ is even; pq is odd; $p^2 - q^2$ is a multiple of 4 (since all odd squares are 1 (mod 4), $1 - 1 = 0$ (mod 4)).
10. **145** $(x - y)(x + y) = 17$. Prime factors are 1 and 17. $x - y = 1, x + y = 17 \Rightarrow x = 9, y = 8$. $x^2 + y^2 = 81 + 64 = 145$.
11. **(A)** Area Square = s^2 . Area Circle = $\pi(s/2)^2 = \pi s^2/4$. Ratio Square:Circle = $1 : \pi/4 = 4 : \pi$.
12. **(C)** Slope $k = (6 - 2)/(3 - 1) = 2$. Perp slope $m = -1/2$. Line m : $y - 6 = -0.5(x - 3) \Rightarrow y = -0.5x + 7.5$. y -intercept is 7.5.
13. **(B)** $P(RR) = (5/8 \times 4/7) = 20/56$. $P(BB) = (3/8 \times 2/7) = 6/56$. Total = $26/56 = 13/28$.
14. **(C)** $|2k - 3| = 7$. Either $2k - 3 = 7 \Rightarrow k = 5$, or $2k - 3 = -7 \Rightarrow k = -2$.
15. **40** Total in sets = $100 - 20 = 80$. Both = (Brand A + Brand B) - Total Union = $(70 + 50) - 80 = 40$.