ADVANCED QUANTITATIVE PRACTICE QUESTIONS

GENERAL ARITHMETIC

A. Sequences and Series

1. A sequence of numbers is given as: 1, 2, 2, 3, 3, 3, 4, 4, 4, 4 and so on. What will be the 100th term of this sequence?

   A. 11
   B. 12
   C. 13
   D. 14
   E. 15

2. A sequence contains the terms 1,-3, 5, -7, 9....., where the n^{th} term is given as $[(-1)^{(n-1)}](2n-1)$.

Quantity A	Quantity B
Sum of the first 25 terms of the given series	50

3. The general term for a sequence is given as $a_n = a_{(n-1)} - a_{(n-2)}$. If $a_1 = -5$ and $a_2 = 4$. What is the sum of the first 100 terms?

   A. 10
   B. 11
   C. 12
   D. 13
   E. 14

4. A sequence of numbers contains terms t_1, t_2, t_3,....., t_n, where every term is equal to the sum of its two preceding terms. $t_5 = 18$ and $t_8 = 76$.

Quantity A	Quantity B
Value of the term t_9	126

5. P & F are two different sequences, where each upcoming term in sequence P is twice the preceding term and each upcoming term in sequence F is three times the preceding term. First terms for the two sequence are given as $P_1 = 5$, $F_1 = 2$.

Quantity A	Quantity B
Max. value of k for $P_k > F_k$, where P_k & F_k are the k^{th} terms for the two sequences	4

6.

Quantity A	Quantity B
$\frac{1}{25}+\frac{1}{26}+\frac{1}{27}+\frac{1}{28}+\frac{1}{29}$	0.2

7. A sequence of terms is given as 3, 33, 333, 3333..... What is the hundreds digit of sum of the first 10 terms of this series?

   (A) 3
   (B) 5
   (C) 6
   (D) 7
   (E) 9

8. Set A consists of positive odd numbers less than 100, set B consists of positive even numbers less than 5 and set C consists of product of all the numbers in set A and set B. What is the number of different numbers possible in set C?

   (A) 50
   (B) 100
   (C) 200
   (D) 250
   (E) 500

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9. A sequence contains the terms $S_1, S_2, \ldots\ldots, S_n$, where $S_2 = 2$ & $S_n = S_{(n-1)} + 2S_2$. What is the value of S_{18}?

A. 60
B. 63
C. 66
D. 70
E. 75

10. A sequence contains terms $A_1, A_2, A_3, \ldots\ldots, A_n$, such that $A_1 = ½$ and general term is given as $A_n = \frac{n}{(n+1)} \times A_{n-1}$

Quantity A	Quantity B
Value of k if $A_k = \frac{1}{15}$	14

11. General term in a sequence is given as $A_k = \frac{1}{k} \cdot \frac{1}{(k+1)}$, where $k = 2, 3, 4, \ldots\ldots, 100$. What is the sum of all the terms in this series?

A. $\frac{1}{3}$
B. $\frac{1}{2}$
C. $\frac{97}{202}$
D. $\frac{99}{202}$
E. 1

12. A sequence contains terms $a_1, a_2, a_3, \ldots\ldots, a_n$, such that $a_1 = 25$ & every number after the first term is -2 times the preceding term.

Quantity A	Quantity B
a_{100}	$-10{,}000$

13. A sequence has terms $a_1, a_2, a_3, \ldots\ldots, a_n$, where $a_1 = 2$ and general term is given as $a_n = a_{(n-1)} \times \frac{1}{2}$

Quantity A	Quantity B
a_6	$2^{14}(a_{20})$

14. A_1, A_2, A_3, A_4 and A_5 are terms of the sequence wh $A_n = n \times (-1)^{n-1}$. What is the range of this sequen

(A) 4
(B) 6
(C) 9
(D) 10
(E) 12

15. General term for a sequence is given as $a_k = \frac{1}{k} \cdot \frac{1}{k}$ where k = 1, 2, ……100. What is sum of all the 100 terms of the given series?

(A) $\frac{1}{100}$
(B) 0
(C) $\frac{100}{101}$
(D) 1
(E) $\frac{101}{100}$

16. A sequence contains terms $x, y, z, w, 0, 1, 1, 2, \ldots$ where every term after the second term is sum the previous two terms. What is the value of x?

(A) 3
(B) 1
(C) 0
(D) -1
(E) -3

~~For Question 17, select all the answer choi~~ that apply.

17. A sequence in which every term is equal to the of its preceding term and constant is called arithmetic sequence. In the following options, wh are in arithmetic sequences if a, b, c, d, e a arithmetic sequence?

(A) $2a, 2b, 2c, 2d, 2e$
(B) $2-10a, 2-10b, 2-10c, 2-10d, 2-10e$
(C) $a+2, b+3, c+4, d+5, e+6$
(D) a^2, b^2, c^2, d^2, e^2

Exponents

1.

Quantity A	Quantity B
300^{900}	900^{300}

2.

Quantity A	Quantity B
$\sqrt{120}+\sqrt{50}$	$\sqrt{80}+\sqrt{90}$

3.

Quantity A	Quantity B
$\left(\frac{0.9}{1.1}\right)^2 + \left(\frac{1.1}{0.9}\right)^2$	2

4. $a^b = 5$, where b is a positive integer

Quantity A	Quantity B
a	2.5

5. If $a^{-3} + b^{-3} = 0$ and $ab \neq 0$, what is the value of $\left(\frac{a}{b}\right)^2$?

(A) -2
(B) -1
(C) 0
(D) 1
(E) 2

6. n is a positive odd integer, $a = \frac{n-1}{2}$ & $b = \frac{n+1}{2}$

Quantity A	Quantity B
-2^a	-2^b

7. $xy \neq 0$ & $x + y \neq 0$

Quantity A	Quantity B
$\frac{1}{x^3+y^3}$	$\frac{1}{(x+y)^3}$

8. Given x is non-zero

Quantity A	Quantity B
$\left(\frac{1}{x^{-2}}\right)^3$	$\left(\frac{1}{x}\right)^{-6}$

9.

Quantity A	Quantity B
-2^{-3}	-4^{-3}

10.

Quantity A	Quantity B
$(n+30)^2 + (n-30)^2$	$120n$

11.

Quantity A	Quantity B
$\frac{2+\sqrt{3}}{(2-\sqrt{3})^3}$	$\frac{10^6}{3^6}$

12. $(x-y)^2 = 16$ & $y = 2$

Quantity A	Quantity B
x	2

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13. If $49 \times 51 = x^2 - 1$, which of the following could be the value of x?

(A) 48
(B) 50
(C) 51
(D) 53
(E) 55

14.

Quantity A	Quantity B
$10^{12} + 2^{12}$	12^{12}

15. $N = (-2)^x$, where x is a negative integer. 'm' is the difference between the highest and the least values of N

Quantity A	Quantity B
m	$\frac{3}{4}$

16. $(m - n) = 4$, where m & n are positive integers.

Quantity A	Quantity B
-1^m	-1^n

17. $x > 0$

Quantity A	Quantity B
$x + (\frac{1}{x})^{-2}$	$x^2 + \frac{1}{x}$

18.

Quantity A	Quantity B
$\frac{5^{20} - 5^{19}}{20}$	5^{18}

19. abc is non-zero

$(ab)^6 = b^4c^8$

Quantity A	Quantity B
$(a)^9$	$(b^{-2}c^{-4})^3$

20. $3^{-3} + 3^{-2} + 3^{-1} =$

(A) 3^{-3}
(B) 3^{-2}
(C) $13(3^{-3})$
(D) $26(3^{-3})$
(E) $39(3^{-3})$

21. $b = -8$ & $(a + b)^2 = 36$

Quantity A	Quantity B
a	14

22. $x > 0$

Quantity A	Quantity B
$2^2\sqrt{x}$	$4^2\sqrt{x^2}$

23.

Quantity A	Quantity B
$0.001^{-1} + 0.999^{-1}$	$0.002^{-1} + 0.998^{-1}$

24. $m > n$ & m, n are positive integers.

Quantity A	Quantity B
$\frac{1}{n^{-m}}$	$\frac{1}{m^{-n}}$

25.

Quantity A	Quantity B
$(-36)^{49}$	36^{-49}

26. P is the product of the positive integers from 2 through 10. If a, b, c, and d are positive integers such that $P = 2^a3^b5^c7^d$, then $a + b + c + d =$

(A) 10
(B) 12
(C) 14
(D) 15
(E) 16

27.

Quantity A	Quantity B
$2^8\,3^{15} + 2^8\,3^{15}$	$(6^8)(3^6)$

28. If x is an integer, what is the minimum value of $3^x + 3^{-x}$?

(A) 0
(B) 1
(C) 2
(D) 3
(E) 4

29. $M = 4^x + 4^x + 4^x + 4^x$. What is the value of M^2?

(A) $2^{(2x+4)}$
(B) $2^{(4x+4)}$
(C) $4^{(x+4)}$
(D) $4^{(2x+4)}$
(E) 4^{4x}

30. $a < 2$

Quantity A	Quantity B
$a^n + \frac{1}{a^{n+2}}$	$a^n + \frac{1}{a^{n-2}}$

31.

Quantity A	Quantity B
$\sqrt{a^2 + b^2}$	$\sqrt{a^2} + \sqrt{b^2}$

32. $x^2 - 36 = 0$ and $x(x-6)(x-8) = 0$

Quantity A	Quantity B
x	0

33. $x^{-1} - y^{-1} = (xy)^{-1}$, $xy \neq 0$

Quantity A	Quantity B
x	y

34.

Quantity A	Quantity B
$\frac{4^{50}}{5^{50}}$	$\frac{8^{25}}{10^{25}}$

35. $t > 0$ and $k > 0$

Quantity A	Quantity B
$t^2 - (2kt) + k^2$	$t^2 - k^2$

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For Questions 36 - 42, select all the answer choices that apply.

36. Which of the following is equal q^{27} for all positive values of q?

(A) $(q^3)^9$
(B) $q^{13}+q^{14}$
(C) $q^9+q^9+q^9$
(D) $(q^9) \times (q^9) \times (q^9)$

37. In how many of the following options, numbers M and N have the same number of factors, both primes and non-primes?

(A) $M = 2^3 \times 5^4 \times 7^6$ and $N = 3^2 \times 4^5 \times 6^7$
(B) $M = 2^3 \times 5^4 \times 7^5$ and $N = 7^3 \times 11^5 \times 13^4$
(C) $M = 200$ and $N = 3087$
(D) $M = 2^5 \times 3^5 \times 5^7$ and $N = 3^3 \times 2^{55}$

38. Which of the following can be prime factors of $7^9 + 7^{10} + 7^{11}$?

(A) 7^9
(B) 7
(C) 3
(D) 19
(E) 57

39. Number N = 9 x 27 x 243 x 729. Which of the following options are true?

(A) $N = 3^{16}$
(B) $N = p \times q$, where $p = (9^8)$ and $q = (9^8)$
(C) $N = 9^{16}$
(D) $N = 9^8$

40. If $a > 0$ and $b > 0$, which of the following is equivalent to

$$\frac{a}{b}\sqrt{\left(\frac{b}{a}\right)^2}$$

(A) 1
(B) $\frac{1}{\sqrt{b}}$
(C) $\sqrt{\frac{1}{b}}$
(D) $\sqrt{\frac{a}{b}}$

41. $\frac{11^{111}}{121^{17}}$ is equal to which of the following options?

(A) 11^{90}
(B) 11^{89}
(C) $(11^9)^9 \times (11^8)$
(D) $(11^{81}) \times (11^8)$

42. If $P = (0.0055)$ $Q = \sqrt{(0.0055)}$ $R = (0.0055)^2$, which of the following options are true?

(A) $P < Q < R$
(B) $Q > P > R$
(C) $R < P < Q$
(D) $R > P > Q$

43. If 70^n is divisible by 5^{16}, then the least value of

If $n = 3$, then the value of $(2^n)^2$ is

45. If m is an even integer, then the unit's digit in the number $(4)^{(3m+1)}$ is

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Percentages

1. The length of a rectangle is increased by 15% and the width is decreased by 15%.

Quantity A	***Quantity B***
Area of the original rectangle	Area of the new rectangle.

2. Mark got a 30% discount on a movie ticket. When the price of the movie ticket increased by 50%, the amount of discount in dollars remained the same. What is the percent discount that he received on the new ticket price?

(A) 10
(B) 15
(C) 20
(D) 25
(E) 28

3. By selling two articles for Rs. X each, Joey gains 30% on one and looses 30% on the other. What is the net profit/loss percentage gained/suffered by Joey?

(A) loss of 15%
(B) loss of 9%
(C) No profit - no loss
(D) profit of 9%
(E) profit of 15%

4. In a survey, it was found that 10% of the students who are susceptible to tuberculosis are less than years of age and 40% of the students who are susceptible to tuberculosis are more than or equal to 20 years of age. If 9% of the total students more than or equal to 20 years of age and susceptible to tuberculosis, then what percent of the students, that are 20 years old or more, not susceptible to tuberculosis?

(A) 20%
(B) 36%
(C) 45%
(D) 54%
(E) 80%

5. The selling price of a USB flash drive is 25% than the list price but 40% more than the cost price. What would be the list price of the USB flash drive if the cost price was \$30?

(A) \$53
(B) \$54
(C) \$55
(D) \$56
(E) \$57

6. A merchant marks the price of an article 35% above its actual cost and then offers some discount to get a profit of 20%. What percentage is the selling price of the article less than the marked price?

(A) 10%
(B) 11.11%
(C) 15%
(D) 22.22%
(E) 25%

7. If a television set was sold at \$800 then a profit of 20% could have been made. But it was sold at a loss of 30%. What was the selling price of the television set?

(A) \$400
(B) \$466.66
(C) \$516.66
(D) \$550
(E) \$580

8. An amount of $\$P$ invested at an annual interest rate of $R\%$ compounded annually increases from 1995 to 1996 and then from 1996 to 1997 so that the final amount becomes $(\frac{7}{5})P$ at the end of 2 years.

Quantity A	***Quantity B***
R	20

9. Which of the following is less than 30% of 1?

(A) 3/17
(B) 1/3
(C) 22/25
(D) 1/2
(E) 3/5

10. The revenue collected from selling television sets in a certain store is calculated by taking the product of the number of television sets sold with the price of each television set. By what percentage the price of a television set must increase to offset a 20% decrease in the number of television sets sold?

(A) 10%
(B) 20%
(C) 25%
(D) 33.33%
(E) 40%

11. In year 1990, the wages of employees in a company Z was \$x. The wages increased by 15% during the time period 1990-1995 and the increase was 30% for the period 1990-2000.

Quantity A	***Quantity B***
Percentage increase from 1995-2000	15%

12. During the years 1980 to 1985, 10% of the population of a city migrated to another city in search of green pastures. The percentage of migrated people from 1980 to 1990 was recorded as 20%. What is the percentage of migrated people during the years 1985 to 1990?

(A) $\frac{100}{11}\%$
(B) 10%
(C) $\frac{100}{9}\%$
(D) 18%
(E) $\frac{100}{3}\%$

13. The profit of store A increases from 20% to 24% while the profit of store B decreases from 24% to 20%.

Quantity A	***Quantity B***
Percentage increase in the profit of store A	Percentage decrease in the profit of store B

14. The side of a square whose area is 44% more than the area of another square is what percentage more than the side of the smaller square?

(A) 10%
(B) 15%
(C) 20%
(D) 25%
(E) 30%

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15. There was a series of two successive discounts of x% on the price of a shirt. The final price of the shirt was tagged at 36% of the original price. What is the value of x?

(A) 30%
(B) 33%
(C) 35%
(D) 40%
(E) 45%

16. The price of a DVD player was increased by p% from \$x to give the new price of \$y. A discount of r% was given on the new price to revert to the original price of \$x.

Quantity A	Quantity B
p	r

17. In an Election, Xandra got $33\frac{1}{3}$% more votes than Yasmin and Yasmin got 25% less votes than Zelia.

Quantity A	Quantity B
Number of votes received by Xandra	8% of votes received by Zelia

18. If x is 130% of y, what percentage of x is y?

(A) 1.3
(B) 130
(C) $\frac{100}{13}$
(D) $\frac{1000}{13}$
(E) $\frac{10000}{13}$

19. Company A sells 20 products, each at the price \$y. In order to keep the revenue unchanged, by what percentage should the number of products sold increase if the price of each product falls by 20%?

(A) 10%
(B) 20%
(C) 25%
(D) 30%
(E) 40%

20. 150% of 40% of 5 =

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

21. Mary buys a shirt at 80% of its tagged price and another shirt at 70% of its tagged price.

Quantity A	Quantity B
The total percent discount offered to Mary on the purchase of the two shirts	75%

22. Town A and town B have some area that is common to both the towns, such that the area of town A that lies in town B is 20% of the area of town B that does not come in town A.

Quantity A	Quantity B
The percent of town A that lies in town B	18%

23. $16^{\frac{1}{2}}$% of 25 =

(A) $\frac{1}{64}$
(B) $\frac{2}{32}$
(C) $\frac{3}{16}$
(D) 16
(E) 64

24. In store A, the selling price of Microwave increased by 25% while the selling price of vacuum cleaner decreased by 25%.

Quantity A	Quantity B
Cost price of the Microwave	Cost price of the vacuum cleaner

25. At the end of year 1994, the profits of company A increased by 40%, while company Y suffered a loss of 20%. At the end of year 1995, the profits of company X decreased by 20%, while company Y enjoyed an increase of 40% in its profits.

Quantity A	Quantity B
Earnings of Company X at the end of 1995	Earnings of Company Y at the end of 1995

26. Out of 28 people that participated in a meeting, 14 were selected of which 7 were below 50 years.

Quantity A	Quantity B
Percentage of the people that participated in the meeting having age less than 50	40%

27. A certain electronic computer retail store that sells only laptops and desktops reported that revenues from laptop sales in 2003 were up by 10 percent from sales in 2002 and revenues from desktop sales in 2003 were down by 20 percent from 2002. If total revenues from laptop sales and desktop sales in 2003 were up by 5 percent from revenue in 2002, what is the ratio of revenue from laptop sales in 2002 to revenue from desktop sales in 2002?

(A) 2: 3
(B) 25: 6
(C) 11: 1
(D) 13: 2
(E) 5: 1

28. A is $33\frac{1}{3}$% more than B and B is 25% more than C.

Quantity A	Quantity B
Percentage by which A is more than C	68%

For Questions 29 - 35, select all the answer choices that apply.

29. In an intercollegiate tournament, Rosebud College won 70% of the first 80 games played during the first session of the year. In order for the college to win at least 80% of the total games played during the entire year, how many more games it will have to play in the remaining sessions of the year ? (*Note* : The college wins all the games in the remaining sessions)

(A) 30
(B) 35
(C) 40
(D) 50
(E) 45

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30.

31. A shopkeeper bought a book during a discount for $x. He sold the book for a profit at $y, 40% off the marked price. Which of the following options are true?

(A) The profit the shopkeeper made was $y

(B) The profit the shopkeeper made was $0.4M - x$, where M is the marked price

(C) The selling price of the book was $0.6M$, where M is the marked price of the book.

(D) The profit the shopkeeper made by selling the book was $0.6M - x$, where M is the marked price of the book.

32. The price of a book was P before any changes. It was increased twice by $x\%$ each time. Which of the following options are true?

(A) The final price of the book after the two successive increases is: $P(1 + (x\%)^2)$

(B) The final price of the book after the two successive increases is: $P(1+x\%)^2$

(C) The total percentage increase in book's price after the two successive increases is: $2x + (x\%)^2$

(D) The total percentage increase in the book's price after the two successive increases is: $(2x + (x^2)\%)\%$

33. In a Class of 36 students, 24 study Maths and the remaining students study physics. Which of the following options must be true?

(A) For the same percentage of students to study the two subjects, six from either subject must swap to the other

(B) For the same percentage of students to study the two subjects, six students from Maths must switch over to Physics

(C) For the same percentage of students to study Maths, for every six new students that join the class, only two must study Physics

(D) For the current ratio of the number of students in the two subjects to invert, at least thirty-six new students must join the current class

34. The radius of a circle is decreased by 20%. Which of the following options are true?

(A) the new area is 64% of the original area

(B) the reduced area must be increased by 36% to increase it to the original area

(C) the reduced area must be increased by 56.25% to increase it to original area

35. Which of the following options represents 20^{th} % of 20?

(A) 4

(B) 1

(C) $\frac{1}{100}$

(D) 0.1

(E) 0.01

36. The price of a book is reduced twice by 10% each. To restore the reduced price to its original price, the reduced price must be increased by a percentage that is:

37. Town A and town B have some area that is common to both the towns, such that the area of town A that lies in town B is 20% of the area of town B that does not come in town (A) The percentage of town B that lies in town A, rounded off to the nearest integer is

38. A, B and C do a business together. After they share profits, A got 20% more than B, but 40% less than (C) The percentage by which B got less than C is

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Compound Interest and Simple Interest

1. Joe invested $1000 at compounded annual interest rate. At the end of 12 years, the total value of the amount will be $4000. In how many years will the total amount become $8000?

(A) 15
(B) 18
(C) 20
(D) 24
(E) 30

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2. The cost of a computer is $y in 2010. If the cost of the computer decreases by 'x%' every year from 2010 to 2055, what will be its cost in dollars after 45 years?

(A) $x\{1-\frac{y}{100}\}^{45}$
(B) $y\{1-\frac{x}{100}\}^{45}$
(C) $y\{1-\frac{45x}{100}\}$
(D) $y\{1-\frac{x}{4500}\}$
(E) $y\{45-\frac{x}{100}\}$

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3. The price of petrol is $\$P$ per gallon in the year 2010 and this price will increase by 25 % every year. What will be the price per gallon of petrol in the year 2020?

(A) $P \times (25)^{10}$
(B) $P \times (0.25)^{10}$
(C) $P \times (1.25)^{10}$
(D) $P \times (1.025)^{10}$
(E) $P \times (0.125)^{10}$

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4. What is the annual rate of interest at which a principal amount of $2000 yields an annual interest of $150?

(A) 6%
(B) 7%
(C) 7.5%
(D) 8.5%
(E) 9%

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5. Betty divided an amount of $40,000 into two parts. She invested one part at an annual interest rate of 4.5% and the other at an annual interest rate of 6%. The total interest earned by her from both the parts after one year was $1890.

Quantity A	***Quantity B***
Interest accrued by the part invested at the rate 4.5% per annum	$600

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6. An amount of $10,000 yields m dollars per annum if invested at annual interest of y%. Another amount $x yields $m/2$ dollars per annum when invested at annual interest rate of $2y$%.

Quantity A	***Quantity B***
x	5000

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7. Alex invested $10, 000 at an annual interest rate of x% and $8000 at an annual interest rate of y%, where $x = \frac{3}{4}y$

Quantity A	***Quantity B***
Interest earned by Alex after one year on the amount of $10,000 invested at the rate of x%	Interest earned by after one year on t amount of $8000 invested at the rate of y%

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5. Two businessmen invest Rs.40, 000 each for a year at different annual rates of interest. The two persons invested the amount again for the second year after adding the interest accrued at the end of the first year to the original principal amount, but at different annual rates of interest.

Quantity A	***Quantity B***
The interest earned by the businessman, who invests at 10% rate in the 1st year and at 6% rate in the second year.	The interest earned by the businessman, who invests the money at 6% rate in the 1st year and 10% rate in the second year.

For Question 9, select all the answer choices that apply.

9. A bank employee invested $2500 in January 2000 at 5% rate of interest p.a. The bank revised the rate of interest to 6% for the whole year of 2001. If he invested the money in January 2000, which of the following options represents the amount of money he will get in January 2002?

(A) 2500(1+0.05) (1+0.06)
(B) 2500(1.113)
(C) 2500(1.03)
(D) 2500(1.5)(1.6)
(E) $2500(1+11/100)^2$

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Venn Diagrams

1. In a pack of plates, $\frac{1}{5}$ of the plates are damaged, $\frac{1}{4}$ of the plates are cracked and $\frac{1}{8}$ are damaged as well as cracked. If 90 plates are not hampered, then what is the number of total plates in the pack?

(A) 180
(B) 120
(C) 240
(D) 280
(E) 360

2. In a group of 65 persons in which every one likes at least one of sky-diving or car-driving, 48 persons like ski-diving and 27 like car driving. How many of the persons like only ski diving?

(A) 17
(B) 27
(C) 38
(D) 40
(E) 45

3. In the New year's party, 77 guests were present. 40 of these guests liked dancing, 23 liked swimming and 6 liked both. How many guests liked only dancing?

(A) 17
(B) 25
(C) 30
(D) 34
(E) 38

4. In a class of 120 students, 40 speak Spanish, 80 speak French, and 80 speak Russian. If each student in the class can speak exactly two of these languages and 10 students can speak all the three languages. How many students in the class do not speak any of the three languages?

(A) 8
(B) 10
(C) 12
(D) 16
(E) 10

5. A survey was conducted on 200 companies that make use of at least one of the two facilities to receive calls: the switch mode or the voice call. It was found that 120 companies use a switch to receive calls while 80 companies use the voice call facility.

Quantity A	Quantity B
The number of companies that use the switch mode but not the voice call facility.	82

6. Out of 200 vehicle-riders on a road, 15% had driving license, 10% had ticket for parking one or more times while 78% had neither a license nor a ticket for parking one or more times. What is the number of people who did not have license but had ticket for parking one or more times?

(A) 10
(B) 14
(C) 18
(D) 22
(E) 26

In a group, consisting only men and women, $\frac{1}{5}$ of the total people are men. If 2 women leave the group, the number of men would become $\frac{1}{3}$ of the remaining people. How many people were present originally in the group?

(A) 8
(B) 10
(C) 12
(D) 15
(E) 20

In an apartment, 81% of the people have a car and 64% have a bike and everyone in the apartment has at least a bike or a car.

Quantity A	Quantity B
Fraction of the total people that have both a bike and a car	$\frac{1}{10}$

On Monday 5 people went to the post office. Of them, 7 people mailed letters, 9 people bought stamps and 10 people mailed packages but didn't buy stamps and didn't mail letters.

Quantity A	Quantity B
The number of people who bought stamps and mailed letters	The number of people who mailed packages but didn't buy stamps and didn't mail any letter

10. Of all the employees in company X, 65% are part time employees, and 15% are part time professional employees. What percent of the part time employees are not professionals?

(A) 25%
(B) 50%
(C) 62.5%
(D) 75.5%
(E) 75%

For Questions 11 - 12, select all the answer choices that apply.

11. Set $A = \{1, 4, 6, 8, 9\}$. Which of the following statements are true?

(A) Set $B = \{1, 4, 6, 8, 10\}$ is a subset of set A
(B) The number of sets containing any two elements of set A is 10
(C) Set $C = \{1, 4, 6, 8, 9\}$ is a subset of A

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NUMBER SYSTEM

1. | Quantity A | Quantity B |
|---|---|
| The remainder when 4^{10} is divided by 5 | The remainder when 3^{12} is divided by 5 |

2. How many integers from 100 through 150 are neither a multiple of 3 nor a multiple of 5?

(A) 25
(B) 26
(C) 27
(D) 28
(E) 29

3. $A = N - 100X - Y$, where 'N' is a three digit number with 'X' as its hundreds digit & 'Y' as its units digit. A must be divisible by which of the following numbers?

(A) 3
(B) 4
(C) 5
(D) 7
(E) 11

4. If x and y are prime numbers greater than 10, which of the following expressions represent an even integer?

(A) $x^2 + xy$
(B) $x^y + 2$
(C) $xy + 2$
(D) $2xy + xy$
(E) $2x + 3y$

5. When integer x is divided by 12, the remainder is 5. What is the remainder when the square of integer x is divided by 8?

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

6. $N = 87^{56}$ & $P = 93^{43}$

Quantity A	Quantity B
Digit at units place of $(N+P)$	Digit at units place of $(N \times P)$

7. Which of the following CANNOT be expressed as the sum of three or more consecutive integers?

(A) 0
(B) 1
(C) 2
(D) 3
(E) 4

8. x is a negative integer.

Quantity A	Quantity B
$(-x)^{3x}$	$(-x)^{3x+1}$

9. n is a positive integer.

Quantity A	Quantity B
The remainder when $5(10^n) + 1$ is divided by 3	The remainder when $5(10^{(n+1)}) + 1$ is divided by 3

10. $A = \{1, 2, 3, 4, 5, \ldots, m\}$
$B = \{1, 2, 3, 4, 5, \ldots, n\}$
where 'n' is an even number and 'm' is an odd number.

Quantity A	Quantity B
Percentage of odd numbers in set A	Percentage of even numbers in set B

11. Which of the following CANNOT be the factor of $(2^n)(3^k)$, where n and k are both positive integers?

(A) 8
(B) 24
(C) 42
(D) 72
(E) 162

12. The reflection of a positive integer is obtained by reversing the digits. For example, 321 is the reflection of 123. The difference between a five-digit integer and its reflection must be divisible by which of the following?

(A) 2
(B) 4
(C) 5
(D) 6
(E) 9

13. If $5^3x + 5^2y + 5z + p = 264$, where x, y, z, p are all positive integers less than or equal to 5, what is the value of $x + y + z + p$?

(A) 8
(B) 10
(C) 12
(D) 14
(E) 16

14. x & y are non-negative integers.

Quantity A	Quantity B
$\sqrt{x} + \sqrt{y}$	$\sqrt{x+y}$

15. $X=7N$, where X is a two digit number and is a multiple of 4. If X lies between 45 and 75, what is the value of X?

(A) 49
(B) 54
(C) 56
(D) 72
(E) 74

16. $3x + 2y + z = 42$; where x, y, z are positive integers.

Quantity A	Quantity B
$x + y + z$	18

17. An integer N gives 21 as the remainder when divided by 24. Which of the following must be a divisor of N?

(A) 3
(B) 4
(C) 5
(D) 6
(E) 7

18. $A = 125 \times 165 \times 688$ & $B = 178 \times 14312 \times 76768$

Quantity A	Quantity B
The units digit of the number A	The units digit of the number B

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19. 63^n is divisible by 3^{16}

Quantity A	Quantity B
n	7

20.

Quantity A	Quantity B
The number of multiples of 7 between 1 and 100, that are not divisible by 6	12

21. How many even integers between 37 and 621 are perfect squares?

(A) 7
(B) 9
(C) 12
(D) 15
(E) 18

22.

Quantity A	Quantity B
The remainder when k is divided by 7	The remainder when $2k$ is divided by 7

23. x and y are expressed as decimals. When $(x + y)$ is rounded to hundredth decimal place, it is equal to x.

Quantity A	Quantity B
y	0.007

24. $A = \{a_1, a_2, a_3, \ldots\ldots, a_{10}\}$
An odd-negative integer N is a product of ten different integers given in set A

Quantity A	Quantity B
Number of odd integers in set A.	Number of negative integers in set A.

25. Numbers P and Q leave equal remainders when divided by 38. When the two numbers are divided by 19, they leave remainders r and s, respectively.

Quantity A	Quantity B
r	s

26. How many numbers between 400 and 800, inclusive, are multiples of 2 and 3?

(A) 48
(B) 49
(C) 50
(D) 51
(E) 52

27. How many numbers between 1 and 2000, inclusive, have both a square root and a cube root as integers?

(A) 3
(B) 4
(C) 5
(D) 6
(E) 7

28. What should be the minimum number of people in a class so that they can be divided into groups of five or eight or twelve?

(A) 12
(B) 30
(C) 60
(D) 120
(E) 150

29. What is the number of positive integral solutions for the equation $\frac{x}{7} + \frac{w}{28} = 1$?

(A) 2
(B) 6
(C) 10
(D) 12
(E) infinite

30. What is the unit's digit of $(3127)^{173}$?

(A) 0
(B) 1
(C) 3
(D) 7
(E) 9

31. A number n is a multiple of 2. X is the unit's digit of 7^n and Y is the unit's digit of 3^n

Quantity A	Quantity B
$X - Y$	0

32. If x, y & z are three positive integers greater than 1 such that $xyz = 231$, what is the value of $x + y + z$?

(A) 9
(B) 15
(C) 21
(D) 24
(E) Cannot be determined

33. x, y, z are negative numbers

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

34.

Quantity A	Quantity B
The number of even numbers whose squares lie through 1 and 100	The number of odd numbers whose squares lie through 1 and 100

35. N is a positive odd integer.

Quantity A	Quantity B
Number of positive odd integers less than N	$\frac{N-1}{2}$

36. N is a positive integer

Quantity A	Quantity B
Remainder when $(N^2 - N)$ is divided by 2	0

37. $n > 10000$

Quantity A	Quantity B
thousand's digit of $\frac{n}{8}$	7

38. x & y are positive integers

Quantity A	Quantity B
$x^2 + y^2$	xy

39. The LCM of the numbers k and m is km and the LCM of the numbers m and n is mn, where k, m & n all are positive.

Quantity A	Quantity B
LCM of k and n	kn

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40. The number x belongs to a set of prime numbers less than 10 and the number y belongs to a set of prime numbers greater than 10.

Quantity A	Quantity B
$(-1)^{(x+y)}$	$(-1)^{(xy)}$

41. The positive integers P and N are not divisible by 4.

Quantity A	Quantity B
The remainder when $P + N$ is divided by 4	1

42. Number of positive divisors of 72 that have 4 in the unit's place is

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

43. $A = 2^1 \times 3^4 \times 5^6$ & $B = 11^3 \times 13^4 \times 17^6$

Quantity A	Quantity B
Number of prime factors of A	Number of prime factors of B

44. $s + t + st$ is an even integer, where s and t are positive integers

Quantity A	Quantity B
Remainder when s is divided by 2	Remainder when t is divided by 2

45. If LCM of x and y is 24 and LCM of z and w is 40, what is the LCM of x, y, z & w?

(A) 30
(B) 60
(C) 72
(D) 100
(E) 120

46. x is an integer such that $x > 3$

Quantity A	Quantity B
number of even factors of $2x$	number of odd factors of $3x$

47. Positive integer A gives a remainder of 6 when divided by other positive integer B. If $A/B = 47.24$, what is the value of B?

(A) 96
(B) 75
(C) 48
(D) 25
(E) 12

48. Which of the following fractions is a terminating decimal, when expressed in decimals?

(A) $\frac{19}{91}$
(B) $\frac{17}{225}$
(C) $\frac{12}{231}$
(D) $\frac{41}{256}$
(E) $\frac{35}{324}$

49. How many integers from 0 to 100, inclusive, have a remainder of 2 when divided by 7?

(A) 14
(B) 15
(C) 16
(D) 17
(E) 18

50. What is the remainder when $(9^{2n+1})(5^n)$ is divided by 10, where n is a positive integer?

(A) 1
(B) 2
(C) 4
(D) 5
(E) 8

51. What is the greatest prime factor of $5^{29} + 5^{28} + 5^{27}$?

(A) 3
(B) 5
(C) 11
(D) 13
(E) 31

52. In the series of all consecutive integers from 1 to n inclusive, the product of all the numbers in the series is divisible by 990.

Quantity A	Quantity B
n	9

53. $m^2 + n^2 = 17$, where m & n are integers. What is the total number of different values of $m + n$?

(A) 1
(B) 2
(C) 3
(D) 4
(E) infinite values

54. $x > 11$

Quantity A	Quantity B
number of prime numbers between x and $2x$	6

55. How many different sets of four consecutive numbers can be formed from the integers from 2 through 20?

(A) 12
(B) 13
(C) 14
(D) 15
(E) 16

56. x, y and z are three consecutive integers, such that $x < y < z$. Which of the following MUST be an even integer?

(A) $x - y^{2z}$
(B) $(x^y)^z$
(C) $(x - y)yz$
(D) xz^y
(E) $y^z(x + y)$

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57. **Quantity A**: Number of odd numbers from 100 to 200, inclusive

Quantity B: Number of even numbers from 100 to 200, inclusive

58. x and x+2 are both factors of y

Quantity A	Quantity B
$x(x+2)$	y

59. Which of the following CANNOT be the sum of 5 consecutive integers?

(A) 10
(B) 15
(C) 20
(D) 25
(E) 28

For Questions 60 - 87, select all the answer choices that apply.

60. A pastor divided chocolates between three children, five children and seven children. In each case, he was left with two chocolates. Which of the following options can be the number of chocolates the pastor had at the beginning of distribution?

(A) 107
(B) 212
(C) 103
(D) 208

61. $A = 4^m$ and $B = 9^n$.

Which of the following could be the unit's [illegible] $A + B$, if m and n are non-negative integers?

(A) 0
(B) 1
(C) 2
(D) 3
(E) 4
(F) 5
(G) 6
(H) 7
(I) 8
(J) 9

62. $A = 4^x$ and $B = 9^y$. Which of the following could be the unit's digit in

$A \times B$, if x and y are integers?

(A) 0
(B) 1
(C) 2
(D) 3
(E) 4
(F) 5
(G) 6
(H) 7
(I) 8
(J) 9

63. In which of the following options, the fractions are in ascending or descending order?

(A) $\frac{7}{6}, \frac{8}{7}, \frac{9}{8}$
(B) $\frac{4}{5}, \frac{7}{8}, \frac{14}{15}$
(C) $\frac{1}{2}, \frac{2}{3}, \frac{1}{4}$
(D) $\frac{4}{5}, \frac{8}{6}, \frac{7}{8}$

64. Two integers X and Y are in the ratio of 5:6. Which of the following options are true?

(A) 11 can be the highest prime factor of X+Y
(B) 3 is the highest prime factor of XY
(C) X+Y must be an odd number
(D) XY must be an even number
(E) X must be less than Y
(F) X must be divisible by 10

65. In a particular year, the savings of A and B are in the ratio of 4: 5, and their expenditures are in the ratio of 3:2. Which of the following answer options are possibly true?

(A) Income of A is 70000
(B) Total expenditure of both A and B is 50000
(C) Savings of A is 1000 more than the savings of B.
(D) The expenses of A is less than that of B by 1000

66. In a family of six children, Pat is taller than Mike, Jack is taller than Rim, Cad is taller than Tom and Tom is taller than Jack. Which of the following options must be true?

(A) Pat is taller than Cad
(B) Cad is taller than Rim
(C) Pat is taller than Jack
(D) Mike is taller than Rim
(E) Jack is shorter than Cad

67. A straight pipe 1 yard in length [illegible] fourths and also in thirds. If the p[illegible] into separate pieces, at each of th[illegible] which of the following gives all the diffe[illegible] of the pieces, in fractions of a yard.

(A) $\frac{1}{6}$
(B) $\frac{1}{4}$
(C) $\frac{1}{12}$
(D) $\frac{1}{3}$
(E) $\frac{1}{24}$
(F) $\frac{2}{3}$
(G) $\frac{3}{4}$

68.

69. The sum of n consecutive integers is 0. Which of the following options is true?

(A) n is odd integer
(B) n is even integer
(C) the median of the numbers must be 0
(D) the average of the numbers is equal to the median

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57. $N = (89_y)^n$, where y is the units digit of the number 89_y. Which of the following can be possible values of y so that the unit's digit of N is y?

(A) 7
(B) 9
(C) 0
(D) 1
(E) 5
(F) 6

71. Jack set for tennis club 15 kms away from his home. From there on he went to gym 8 kms away. How far is Jack now from his home, if he walks linearly between every two places?

(A) 7
(B) 23
(C) 17
(D) 8

72. $P = 5q$, where P, which is divisible by 4, and q are both integers. Which of the following options can be values for P, if it must be divisible by 6?

(A) 30
(B) 60
(C) 100
(D) 120
(E) 180
(F) 80

73. According to Bushwell Town's building ... building must have a lift if it has at least 4 ... Which of the following will be true ... buildings in Bushwell town?

(A) Mike can use a lift in Topaz towers, ... 12 floors.
(B) Milton tower that has only 3 floors ... have a lift.
(C) Bill, a builder, can provide a lift for ... having only 2 floors.
(D) None of the above options.

74. p is the remainder on dividing X by 2, while q ... remainder on dividing Y by 2. To find the ... between p and q, whether p is equal to q or ... or less, which of the following options is ... sufficient?

(A) X is an even integer.
(B) Y is an odd integer.
(C) Y is a non-negative number.
(D) $X + Y + XY$ is an odd integer and q is not ...
(E) $X + Y + XY$ is an even integer.

75. a and b are positive integers. Also, $a + b$ and $\frac{a}{2}$ ... both even integers. Which of the following option ... are true?

(A) a must be even
(B) b must be divisible by 2
(C) a must be divisible by 4
(D) b is never an odd integer

76. a, b and c are three positive integers and $2^a = 2^b + 2^c$. Which of the following options must be true?

(A) $a = b + c$
(B) $a > b$
(C) $a < b + c$, without $a = 2$
(D) $b \neq c$

77. An integer Q is odd, negative and product of ten different integers. Which of the following options are true?

(A) Each of the integers in the product is negative
(B) Each of the integers in the product is odd
(C) Every odd numbered integer in the product must be negative
(D) All the integers in the product are negative

78. N is an even integer. Which of the following options are applicable on the number of N?

(A) There will be 8 values of N, if N is a perfect square that lies between 55 and 555, inclusive
(B) There will be 15 values of N, if N is a perfect square that lies between 55 and 555, inclusive
(C) There will be 16 values of N, if the square of N lies between 55 and 555, inclusive
(D) There will be 8 values of N, if the square of N lies between 55 and 555, inclusive

79. Which of the following numbers have both a square root and a cube root as an integer?

(A) 25
(B) 1
(C) 100
(D) 64
(E) 729

80. In which of the following options, the three numbers is less than each of ... of the list?

(A) $\frac{1}{3}, \frac{1}{4}, \frac{3}{4}$
(B) $-3, 4, 9$
(C) $-\frac{2}{3}, 3, \frac{3}{4}$
(D) $-3, 9, -1$

81. On a number line, p and q are two numbers on opposite sides of 0. Which of the following options are true?

(A) p and q are always opposite in sign
(B) $pq > 0$
(C) $pq < 0$
(D) $p + q > 0$, if $|q| > |p|$
(E) $\frac{p}{q} < 1$, if $|p| > |q|$

82. m and n are positive integers, each greater than 1. If $7(m - 1) = 5(n - 1)$, which of the following options could be true?

(A) $m + n = 14$
(B) $m - n = -2$
(C) $n - m = -2$
(D) $m + n = 12$

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57. A clock A rings an alarm first at 9 am, and another clock B also rings an alarm first at 9 am. Clock A rings other alarms at intervals of 7 minutes, while clock B rings an alarm at intervals of 8 minutes. Which of the following options represents time at which the two clocks ring alarms simultaneously?

(A) 9:14 am
(B) 9: 56 am
(C) 10:26 am
(D) 11:48 am.

84. The numbers in which of the following options have exactly three positive divisors?

(A) 121
(B) 81
(C) 1331
(D) 49
(E) 729

85. The number of factors of $A = 2^3 \times 5^7 \times 7^2$ is

86. The unit's digit in $(126)^{127}$ is

87. The number of positive integral values of x satisfying the inequality

$|3 - x| \leq 6$ is

88. Given two equations: $x^2 - 5x + 6 = 0$ and $x^2 - 3x + 2 = 0$. Then the value of x is

89. A secretary typed 10 letters, each of which had 1 or 2 pages. If the secretary typed 20 pages in all, how many of the letters had 2 pages?

90. The number of multiples of only one of 5 or 7 between 200 and 500, inclusive, is

91. In the fraction $\frac{2}{7}$, the digit in the 75th place to the right of the decimal is

92. In a school $\frac{3}{5}$ of the girls and $\frac{2}{3}$ of the boys are physics students, which is $\frac{5}{8}$ of the total numbers of students. What fraction of the total students are girls?

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INEQUALITIES AND MODULUS

1. Which of the following options should be the least value of n that satisfies the inequality, $2^n > (10^{100})$?

(A) 30
(B) 45
(C) 60
(D) 75
(E) 90

2. If $-1 < x < 0$, which of the following is greatest?

(A) x
(B) x^2
(C) $1 - x$
(D) $1 - x^2$
(E) $1 - x^3$

3. If $x < 0$ and $0 < y < 1$, which of the following has the greatest value?

(A) x^2
(B) $(xy)^2$
(C) $\left(\frac{x}{y}\right)^2$
(D) $\frac{x^2}{y}$
(E) x^2y

4. $y < x < -y$

Quantity A	Quantity B
y^3	x^3

5. $|2x-3| < 8$, where x is an integer. What is the number of possible values of 'x' that satisfy the given inequality?

(A) 2
(B) 4
(C) 6
(D) 8
(E) 10

6. If $x^2 + x - 6 < 0$, what is the number of possible values of integer x, that satisfy the given inequality?

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

7. If $y < -3$, which of the following must be true?

(A) $y < y^3 < y^4 < y^2$
(B) $y^4 < y^2 < y^3 < y$
(C) $y^3 < y < y^2 < y^4$
(D) $y^2 < y^3 < y^4 < y$
(E) $y^3 < y < y^4 < y^2$

8. $|k+2| = |k-2|$

Quantity A	Quantity B
k	0

9. $\frac{x}{y} > 1$

Quantity A	Quantity B
$\frac{x+y}{y-x}$	2

10. If $-6 \le x \le 4$ and $-10 \le y \le 4$, what is the greatest value of $(-x^2 + y^4)$?

(A) 0
(B) 256
(C) 1000
(D) 9744
(E) 10000

11. $b < a$

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

12. $|2x + 7| < 13$

Quantity A	Quantity B
x	9

13. $x < y$

Quantity A	Quantity B
$x^2 + x + 1$	$y^2 + y + 1$

14. $x < 2$ & $y < 3$

Quantity A	Quantity B
xy	6

15. $27 < x^3 < 125$

Quantity A	Quantity B
x	4

16. $x < 0$

Quantity A	Quantity B
$\lvert x \rvert$	$-x$

17. $x < 0$

Quantity A	Quantity B
$\lvert x \rvert + \lvert 2 \rvert$	$\lvert x - 2 \rvert$

18. $x + y > 0$ and $y < 0$

Quantity A	Quantity B
x	$\lvert y \rvert$

19. $x > y$ & $y < 0$

Quantity A	Quantity B
$x - y$	$(y - x)^2$

20. $\lvert 2x + 49 \rvert < 13$

Quantity A	Quantity B
x^2	9

21. $1 < a < 2$, $3 < b < 4$, $5 < c < 6$

Quantity A	Quantity B
$\frac{ab}{c}$	$\frac{1}{6}$

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22. $z > 0, w > 0$

Quantity A	Quantity B
$w^4 + z^2$	$z^2 + w$

23. $x - y = 1, x > 0$ & $y > 0$

Quantity A	Quantity B
$x^2 - y^2$	0

24. $xy > 1$ and $x - y = 1$

Quantity A	Quantity B
x	y

25. $y = 2 - \lvert x - 2 \rvert$ and $-1 \le x \le 5$

Quantity A	Quantity B
y	3

26. $1 - x < 0$

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

27. $0 < x < y < z$

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

28. If $\lvert p - 8 \rvert = 3p$, then $p =$

(A) -4
(B) -2
(C) 1
(D) 2
(E) 4

29. M represents the minimum positive value of the expression $\lvert 15x + 25y \rvert$, where x & y are different integers

Quantity A	Quantity B
M	5

30. $100 < a < b < 1000$

Quantity A	Quantity B
$\frac{1}{a} - \frac{1}{b}$	$\frac{1}{100} - \frac{1}{1000}$

31. $xy < 36$.

Quantity A	Quantity B
$(x + 1)(y + 1)$	49

For Questions 32 - 41, select all the answer choices that apply.

32. If $p > 0$ and $0 < 1 - (\frac{q}{p}) < 1$, then which of the following must be true?

(A) $p > q$
(B) $q > 0$
(C) $\frac{q}{p} < 1$
(D) $\frac{p}{q} < 1$

33. Which of the following options must be true m: if $1 \ge m^2$?

(A) $m \ge 1$
(B) $1 \ge m$
(C) $1 \ge m \ge 0$
(D) $m \ge -1$

34. If $0 < x < 1$, which of the following options are true?

(A) $x^2 > x^3$
(B) $x < x^2$
(C) $x > x^3$
(D) $x^4 > x^5 > x^6 > x^7$

35. $0 < p < 1$, then which of the following inequalities must be true?

(A) $p^3 < p^3$
(B) $p < p^2$
(C) $p^4 - p^3 < p^2 - p^5$
(D) $p^4 - p^3 < p^2 - p^3$

36. Suppose $M = \lvert 15x + 25y \rvert$. x and y are different integers. Which of the following can be possible values of M?

(A) 10
(B) 0
(C) 2
(D) 5

37. $x^2 - 5x + 6 > 0$. Which of the following options may be true?

(A) $x > 2$.
(B) $x > 3$
(C) $x < 2$
(D) $x < 3$
(E) $2 < x < 3$

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38. x and y are integers such that $-8 \le x \le 10$ & $x + y = -4$. Which of the following can be the values of xy?

(A) $xy = 0$
(B) $xy = -9$
(C) $xy = 9$
(D) $x = \frac{1}{y}$
(E) $xy = 130$

39. Given two equations: $x^2 - 9 \le 0$ and $y^2 - 16 > 0$. Which of the following options are true about xy, if x and y are integers?

(A) the least positive integral value of xy is 4
(B) the least positive integral value of xy is 5
(C) the highest negative integral value of xy is -5
(D) the least negative integral value of xy is -5

STATISTICS

1.

Quantity A	Quantity B
Standard Deviation of 10, 20, 50, 80, 90	Standard Deviation of 10, 30, 50, 70, 90

2. In a company having fifty employees, 36 of the employees earn a salary that is above $40000 per annum.

Quantity A	Quantity B
Median of the annual salaries for the 50 employees	$36,500

3. The average (arithmetic mean) of the 5 positive integers k, m, r, s, and t is 16, where $k < m < r < s < t$. If $t = 40$, what is the greatest possible value of the median of these 5 integers?

(A) 16
(B) 18
(C) 19
(D) 20
(E) 22

4. $P = \{x, x + 1, x + 2, 3x + 4, 4x + 3\}$

Quantity A	Quantity B
The mode of the set P	The median of the set P

5.

Quantity A	Quantity B
Standard Deviation of 4, 5, 6, 7, 8	Standard Deviation of 33, 33, 34, 34, 35, 35

6. How many values should x have, so that the mean of 10, 20, x is equal to the median of 10, 20, x?

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

7. What is the mean of a series of 5 integers that satisfies the following conditions?

I. Median of the series is 7,
II. Mode of the series is 4 and,
III. The arithmetic mean of the largest and second largest number in the series is 20.

(A) 7
(B) 9
(C) 11
(D) 13
(E) 15

8. Prices of five different items in a sale reported by Jack were $257, $450, $550, $850 and $1020. Two of the prices were wrongly reported by Jack by mistake, one with $120 increase and other with $120 decrease.

Quantity A	Quantity B
Standard deviation of the reported prices	Standard deviation of the actual prices

9. $M = \{n, n + 1, n + 2, n^* + 3, n + 4\}$.

Quantity A	Quantity B
Standard Deviation of the numbers in set M	n

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10. Prices of 5 different boats are \$1200, \$700, \$1500, \$1400 and \$1100.

Quantity A	Quantity B
Standard Deviation of the final prices, if service charge of \$150 is added to the price of each boat.	Standard Deviation of the final prices, if service charge of 10% of the prices is added to the respective prices of each boat.

11. In a group of 50 numbers, average of the first 25 numbers is 16, that of next 10 numbers is 15 and that of the remaining is 20. What is the average of the entire group of numbers?

(A) 14
(B) 15
(C) 16
(D) 17
(E) 18

12. $P = \{-3, -2, -1\}$
$Q = \{1, 2, 3\}$
$R = \{-3, -2, -1, 1, 2, 3\}$

If s_1, s_2, s_3 are the standard deviations of sets P, Q & R respectively, which of the following must be true?

I. $s_1 < s_2$
II. $s_2 = 0$
III. $s_3 = 0$

(A) I only
(B) I and II
(C) II and III
(D) I and III
(E) None

13. Sets S and T satisfy the conditions that all numbers in set S are in set T and the average of numbers in set S is equal to the average of numbers in set T.

Quantity A	Quantity B
Standard Deviation of set S	Standard Deviation of set T

14. Scott bought X pens for \$0.30 each and Y pencils for \$0.40 each, where Y is more than X.

Quantity A	Quantity B
Mean of the prices of all the pens and pencils bought by Scott	0.36

15. Of the 15 employees in a company, the mean of the salaries of seven employees who are the least paid is X and the mean of the salaries of the remaining highest paid employees is Y.

Quantity A	Quantity B
The mean of the salaries of all the 15 employees.	$\frac{(x+y)}{2}$

16. Mean of a group of 10 numbers is 10.8 and standard deviation for this group is 0

Quantity A	Quantity B
Range of the given group of numbers	0

17. The range of set A containing 10 numbers is 16 and that of set B containing 8 numbers is 10. If Set A and Set B are combined, what is the minimum value of the range of the new set?

(A) 6
(B) 8
(C) 10
(D) 16
(E) 26

18.

Number of students	Lowest Score	Range
10	110	21
11	129	41

Quantity A	Quantity B
Median score of the 21 students combined.	129

19. The average salary of one group having n number of employees is \$32,000 and the average salary of another group having $(n-1)$ number of employees is \$33,000.

Quantity A	Quantity B
The average salary of all the $(2n-1)$ employees.	\$32,500

20. There are 35 females in a club having an average age of 'f', and 45 males in the same club having an average age of 'm'. 'f' is greater than 'm'

Quantity A	Quantity B
Average age of all the 80 members of the club	$\frac{(f+m)}{2}$

21.

No. of Members	Least weight	Range
20	100	29
21	130	35

When the two groups are joined, what is the median weight of the combined group?

(A) 100
(B) 110
(C) 117
(D) 129
(E) 130

22. The average score of the members of junior team who have taken a test is 88 while the average score of the members of senior team is 92 for the same test.

Quantity A	Quantity B
The average score of all the members of senior team and the junior team combined.	90

23. The arithmetic mean of a set of p terms is 75 and arithmetic mean of another set having n terms is 92. What is the value of $\frac{p}{n}$, if the combined average of the two sets is 84?

(A) $\frac{5}{6}$
(B) $\frac{6}{7}$
(C) $\frac{7}{8}$
(D) $\frac{8}{9}$
(E) $\frac{9}{10}$

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24. A particular year has 365 days.

Quantity A	Quantity B
Mean value of the number of days per month.	Median value of the number of days per month.

25. $2 < a < 6 < b < 10$ & the arithmetic mean of 3, 6, 9, a, b is 6.2

Quantity A	Quantity B
$6 - a$	$b - 6$

26.

Marks	No. of students
40	3
60	4
70	14
80	8
90	11

Quantity A	Quantity B
Median of the scores for the data given in above table	Average of the scores for the data given in above table

27. The mean of five numbers is 82. Four of them are 50, 60, 90 and 100.

Quantity A	Quantity B
Median of five numbers	82

28. The average of 7 numbers is 64. The [illegible] changes to 60 when two numbers are removed. If [illegible] is the average of the two numbers removed?

(A) 37
(B) 66
(C) 74
(D) 132
(E) 148

29. What is the approximate value of the [illegible] deviation of the numbers 3, 7, 9, 13, 18?

(A) 2.13
(B) 3.13
(C) 4.13
(D) 5.13
(E) 6.13

30. A line is marked with the points –4, –3, –2, –1, 0, 1, 2, 3, and 4 at equal distances. The points –4, –3, –2, –1, 1, 2, 3, 4 are labeled with alphabets from A to G. By what value is the mean of the labeled numbers less than the median of the labeled numbers?

(A) 0
(B) $\frac{2}{7}$
(C) $\frac{4}{7}$
(D) $\frac{4}{3}$
(E) 2

31. There are five numbers in a series, 19, 22, 25, 26 and 28. When each of the numbers is increased by k the mean of the numbers becomes 28.5. What is the median of the new numbers?

(A) 24.5
(B) 26
(C) 28.5
(D) 29.5
(E) 31.5

32. The average of five numbers x_1, x_2, x_3, x_4, and x_5 is S and the average of three other numbers y_1, y_2, y_3 is R. What is the average of the numbers $x_1, x_2, x_3, x_4, x_5, y_1, y_2$, and y_3?

(A) $\frac{5S+3R}{8}$
(B) $\frac{S}{8}$
(C) $\frac{R}{8}$
(D) $\frac{S+R}{8}$
(E) $\frac{3S+5R}{8}$

33. $0 < t < u < v$

Quantity A	Quantity B
Mean of t, u, v	Median of t, u, v

34. The average of the numbers a, b, c, -5, -15 is s and the average of the numbers a, b, c, 5, 15 is t. What is the value of $(s-t)$?

(A) –8
(B) –5
(C) –1
(D) 0
(E) 5

35. For which of the data sets given below is arithmetic mean equal to median?

I. $x, x+1, x+2, x+3, x+4$
II. $x, 2x, 3x, 4x, 5x$
III. $\frac{1}{x}, \frac{2}{x}, \frac{3}{x}, \frac{4}{x}, \frac{5}{x}$

(A) I only
(B) II only
(C) III only
(D) I and III
(E) I, II and III

36. $A = \{5 - 2x, 5 - x, 5, 5 + x, 5 + 2x\}$

Quantity A	Quantity B
Standard Deviation of the numbers in set A	The greatest value in set A

37. $M = \{-14, -11, -7, 9, 10, 13\}$

Which of the following statements is true for the numbers in set M?

I. Median is greater than mean
II. S.D is greater than range
III. Mean is greater than median

(A) I only
(B) II only
(C) I and III
(D) I, II, III
(E) None of these

38.

Quantity A	Quantity B
Standard deviation of the numbers 9, 9, 10, 11, 11	Standard deviation of the numbers 6, 8, 10, 12, 14

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39.

Quantity A	Quantity B
Standard deviation of the numbers 56, 76, 98, 86	Standard deviation of the numbers 88, 72, 53, 88

40. The average of the first 5 numbers in a set consisting of 12 numbers is 6, while the average of all the numbers in the set is 7.5. Approximately what is the average of the last 7 numbers?

(A) 8.47
(B) 8.57
(C) 8.67
(D) 8.77
(E) None of these

41.

Quantity A	Quantity B
Standard Deviation of the numbers 23, 24, 25, 26, 26, & 26	Standard Deviation of the numbers 25, 26, 27, 28, 29 & 30

42.

43.

Quantity A	Quantity B
Standard Deviation of the numbers 1, 2, 3, and 4	Half of the Standard Deviation of the numbers 3, 4, 6, and 7.

44. $R = \{50,50,50,50,50\}$
$S = \{5,10,5,0,5\}$

Quantity A	Quantity B
The standard deviation of the numbers in set R	The standard deviation of the numbers in set S

45. The sum of the scores of a student in 5 tests is 120 and at least two of the scores are less than 20.

Quantity A	Quantity B
Average score of the five tests	Median value of the score in five tests

46. New York tea company has 80 pounds of tea in stock, 20% of which is lemon flavored. If company does not sell any stock of tea but buys another 20 pounds of tea of which 60 % is lemon flavored. What percentage by weight of the company's total stock of tea is lemon flavored?

(A) 40%
(B) 35%
(C) 31%
(D) 30%
(E) 28%

47. A tourist purchased a total of 30 traveler's checks in $ 50 and $100 denominations. The total worth of the traveler's checks is $1800. How many checks of $50 denominations can he spend so that average amount (arithmetic mean) of the remaining traveler's checks is $80?

(A) 4
(B) 12
(C) 15
(D) 20
(E) 24

48. Each of the 60 mineral water bottles in a certain shipment is either 500 ml bottles or 1 liter bottles, and the average (arithmetic mean) volume of the bottles in the shipment is 800 ml. If the average volume of the bottles in the shipment is to be reduced to 600 ml by removing some of the 1 liter bottles, how many 1 liter bottles must be removed?

(A) 24
(B) 36
(C) 20
(D) 30
(E) 40

49. $A = \{15,19,20,21,25\}$
$B = \{15,18,20,22,25\}$

Quantity A	Quantity B
Standard Deviation of set A	Standard Deviation of set B

50. Distribution of numbers in a certain group of integers is shown in the following table.

Number	Frequency in the group
30	60
40	70
50	80

Quantity A	Quantity B
median of the given data	mean of the given data

51. A series of terms has 75 terms, where the n^{th} term of the series is given as $2n+5$.

Quantity A	Quantity B
Median of the given series of terms	81

52. The mean of 3 numbers $2x$, $7x$ and x^2 is 12, where $x < 0$. What is the range of the given 3 numbers?

(A) 84
(B) 144
(C) 176
(D) 228
(E) 256

For Questions 53 - 63, select all the answer choices that apply.

53. In a group of hundred businessmen, the ages of the youngest and the oldest are 30 and 60 respectively. Which of the following will be independently sufficient to find the median age of the businessmen?

(A) the average age of all the businessmen in the group is 45
(B) the individual ages of all the businessmen in the group
(C) the number of young and old businessmen in the group

54. In the list of numbers: 2, 4, 6, 8, x, 3, 5, 7, 9 if x is an integer between 1 and 10, inclusive, then which of the following can be the values for median of the above list?

(A) 4
(B) 5
(C) 6
(D) 5.5

55. In a certain sample of data, the mean is 80 and the standard deviation is 4. Which of the following values are more than 7.5 standard deviations from the mean?

(A) 120
(B) 100
(C) 110
(D) 50

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56. Which of the values in the options below can p take if the average of p, 30, 40 is same as the median of 40, 30 and p?

(A) 0
(B) 15
(C) 30
(D) 35
(E) 20

57. In a family of 10 persons, which of the following information is sufficient to find the median age of the persons?

(A) the age of the youngest person which is 20 years.
(B) the age of the oldest person which is 50 years.
(C) the average age of the family members which is 35 years.
(D) the individual ages of each of the ten persons in the family.
(E) the average age of the persons if every member is exactly 3 years younger to the one born just before him.

58. Set A and Set B contain some elements. To exactly find the minimum value of the range of the set containing the elements of both the sets A and B, the information in which of the following options is independently sufficient?

(A) the elements of set A
(B) the elements of set B
(C) the values of the range of set A and the range of set B
(D) the values of the highest and the lowest elements in each of Set A and Set B.

59. Given the Set A: $\{p, q, r, s, t\}$. Which of the follow... options will be sufficient in finding the Stand... Deviation, $S.D.$ of set A?

(A) $S.D.$ of the set $\{p+100, q+100, r+100, s+10$... $t+100\}$
(B) $S.D.$ of the set $\{100p, 100q, 100r, 100s, 10$...
(C) $S.D.$ of the set $\{p+100, 2q+100, 3r+10$... $4s+100, 5t+100\}$
(D) $S.D.$ of the set $\{\frac{p}{2}, \frac{q}{3}, \frac{r}{4}, \frac{s}{5}, \frac{t}{6}\}$
(E) None of the options above is useful to fin... the $S.D.$ of the set (A)

60. In an office having 120 employees, there are old and young persons. Which of the following must be true, if the average age of the young is 35 and that of the aged is 55?

(A) the average age of all the employees will be 45, if the number of young and old employees in the office is same.
(B) the average age of all the employees in the office may be 49, if the number of aged persons is 65.
(C) the average age of all the employees in the office may be 41, if the number of young persons is 65.
(D) the average age of all the employees in the office may be 49, if the number of aged persons in the office is 55
(E) the average age of all the employees in the office may be 41, if the number of young persons in the office is 55.

61. In Set A: $\{x, 10, 20\}$ and in Set B: $\{15, 20, y\}$, the elements are in arithmetic sequence. Which of the following options are possibly true for all possible values of x and y in their respective sets?

(A) $x - y = 0$
(B) $x + y = 40$
(C) $x - y = 32.5$
(D) $y = x + 10$

62. a, b, c, d, e, f are some numbers such that $a < b < c < d < e < f$, and all of the numbers are positive integers. Of the following, which options are true?

(A) the mean of the above numbers is $(a + f)/2$, if the difference between any two successive numbers is same
(B) the median of the numbers is $(a + f)/2$, if option A holds true
(C) if $a - c = d - f$, then the numbers given above are in arithmetic sequence.

63. The average of some numbers in arithmetic sequence is 10. The median of these numbers is

64. If range and standard deviation of some numbers are equal, then each of the two must be equal to

65. The standard deviation of the set $\{4, 4, 4, 4, 4\}$ is

66. If the average of p, q and r, in which the succeeding term is equal to the sum of the preceding term and a constant, is equal to the average of 10, 15, 20, then q is

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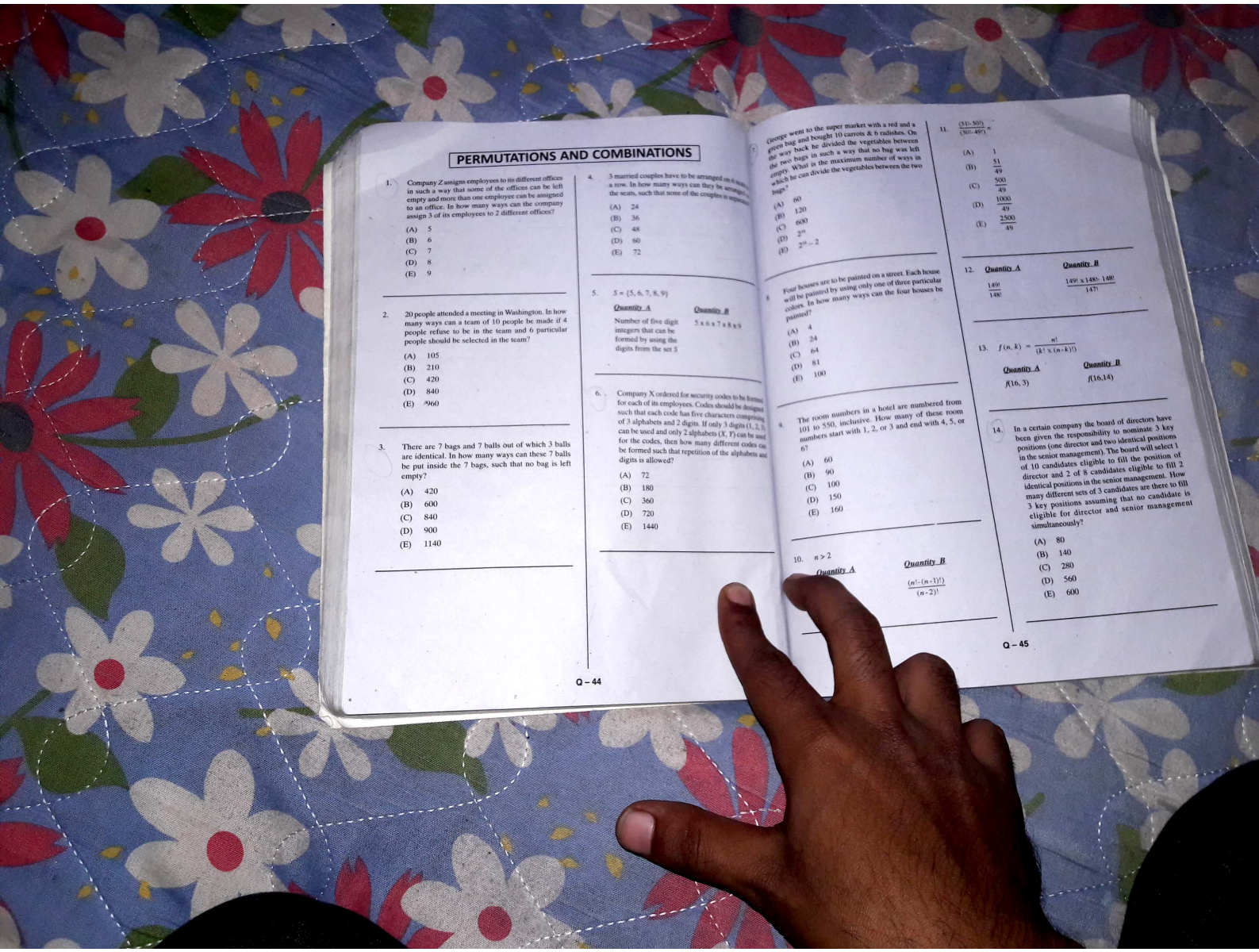

PERMUTATIONS AND COMBINATIONS

1. Company Z assigns employees to its different offices in such a way that some of the offices can be left empty and more than one employee can be assigned to an office. In how many ways can the company assign 3 of its employees to 2 different offices?

(A) 5
(B) 6
(C) 7
(D) 8
(E) 9

2. 20 people attended a meeting in Washington. In how many ways can a team of 10 people be made if 4 people refuse to be in the team and 6 particular people should be selected in the team?

(A) 105
(B) 210
(C) 420
(D) 840
(E) 960

3. There are 7 bags and 7 balls out of which 3 balls are identical. In how many ways can these 7 balls be put inside the 7 bags, such that no bag is left empty?

(A) 420
(B) 600
(C) 840
(D) 900
(E) 1140

4. 3 married couples have to be arranged on 6 seats in a row. In how many ways can they be arranged on the seats, such that none of the couples is separated?

(A) 24
(B) 36
(C) 48
(D) 60
(E) 72

5. $S = \{5, 6, 7, 8, 9\}$

Quantity A	Quantity B
Number of five digit integers that can be formed by using the digits from the set S	$5 \times 6 \times 7 \times 8 \times 9$

6. Company X ordered for security codes to be formed for each of its employees. Codes should be designed such that each code has five characters comprising of 3 alphabets and 2 digits. If only 3 digits (1, 2, 3) can be used and only 2 alphabets (X, Y) can be used for the codes, then how many different codes can be formed such that repetition of the alphabets and digits is allowed?

(A) 72
(B) 180
(C) 360
(D) 720
(E) 1440

7. George went to the super market with a red and a green bag and bought 10 carrots & 6 radishes. On the way back he divided the vegetables between the two bags in such a way that no bag was left empty. What is the maximum number of ways in which he can divide the vegetables between the two bags?

(A) 60
(B) 120
(C) 600
(D) 2^n
(E) $2^n - 2$

8. Four houses are to be painted on a street. Each house will be painted by using only one of three particular colors. In how many ways can the four houses be painted?

(A) 4
(B) 24
(C) 64
(D) 81
(E) 100

9. The room numbers in a hotel are numbered from 101 to 550, inclusive. How many of these room numbers start with 1, 2, or 3 and end with 4, 5, or 6?

(A) 60
(B) 90
(C) 100
(D) 150
(E) 160

10. $n > 2$

Quantity A	Quantity B
	$\frac{(n!-(n-1)!)}{(n-2)!}$

11. $\frac{(51)-50!)}{(50!-49!)} =$

(A) 1
(B) $\frac{51}{49}$
(C) $\frac{500}{49}$
(D) $\frac{1000}{49}$
(E) $\frac{2500}{49}$

12.

Quantity A	Quantity B
$\frac{149!}{148!}$	$\frac{149! \times 148! - 148!}{147!}$

13. $f(n, k) = \frac{n!}{(k! \times (n-k))}$

Quantity A	Quantity B
$f(16, 3)$	$f(16,14)$

14. In a certain company the board of directors have been given the responsibility to nominate 3 key positions (one director and two identical positions in the senior management). The board will select 1 of 10 candidates eligible to fill the position of director and 2 of 8 candidates eligible to fill 2 identical positions in the senior management. How many different sets of 3 candidates are there to fill 3 key positions assuming that no candidate is eligible for director and senior management simultaneously?

(A) 80
(B) 140
(C) 280
(D) 560
(E) 600

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15. A 'secure code' is defined as a sequence of different digits chosen from all non-negative single digit integers. What is the ratio of the number of 4-digit secure codes to the number of 3- digit secure codes?

(A) 4 to 3
(B) 7 to 1
(C) 7 to 6
(D) 26 to 1
(E) 19 to 1

16.

Quantity A	Quantity B
$(7!)^2$	13!

17. In how many different ways can the six symbols @, $, $, $, @, & be arranged on a straight line?

(A) 30
(B) 60
(C) 90
(D) 120
(E) 600

18. On the New Years Eve, every member of a community exchanged cards with every other member. If a total of 420 different cards were exchanged, then how many different members were there in the community?

(A) 15
(B) 21
(C) 35
(D) 140
(E) 210

19. Alice, Beck, Claudia, Delilah and Eric have to be seated on a straight line for a group photo. How many photos having different arrangements of the five people can be clicked such that Beck and Claudia have to sit together in each photo?

(A) 12
(B) 36
(C) 48
(D) 60
(E) 120

20. The number plate of a car can have 3 letters followed by 4 digits and repetition of both letters and digits can occur in the number plate. If the letters that can be used are A, F and G and numbers that can be used are 1, 2 and 3, then in how many different ways can the number plate be made?

(A) 7!
(B) 3! x 4!
(C) 3^5
(D) 3^7
(E) 7^3

21. The total number of ways in which all the letters of the word THEATRE can be arranged is

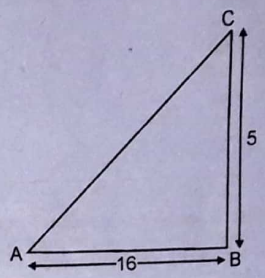
PROBABILITY

1. There are 20 colored pencils in a pencil stand. The probability of choosing a yellow colored pencil is 0.8. There are 6 yellow colored pencils without an eraser. What is the probability that a yellow colored pencil chosen at random is the one that has an eraser?

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

2. Sets M and N are such that, $M = \{-6, -5, -4, -3, -2\}$ & $T = \{-2, -1, 0, 1, 2, 3\}$. If two integers are randomly selected, one from set M and the other from set N, what is the probability that the product of the two integers is negative?

(A) 0
(B) $\frac{1}{3}$
(C) $\frac{2}{5}$
(D) $\frac{1}{2}$
(E) $\frac{3}{5}$



3. 'S' is some point on the base AB of the right angled triangle ABC, right angled at B.

Quantity A	Quantity B
Probability that the length of SC is less than 13.	0.6

4. A bag contains ten balls numbered 1 to 10. If two balls are selected from the bag with replacement, what is the probability that at least one of them is an even numbered ball?

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

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5. 8 people have to go to the hospital during a particular week. What is the probability that on atleast one of the days, atleast two people will go to the hospital?

(A) 0.2
(B) 0.3
(C) 0.7
(D) 0.8
(E) 1

6. Set A contains all the odd numbers from 1 to n, inclusive. If n is odd, what is the probability that a number selected at random from the set A is an odd number?

(A) $\frac{1}{3}$
(B) $\frac{1}{2}$
(C) $\frac{2}{3}$
(D) 1
(E) Cannot be determined

7. A total of 10 people will watch a movie on 7 days of the week. What is the probability that at least two of them will watch the movie on the same day?

(A) $\frac{1}{3}$
(B) $\frac{1}{2}$
(C) $\frac{2}{3}$
(D) 1
(E) Cannot be determined

8. Three tools are taken out of a tool box having ten different machine tools. If three out of the 10 tools in the tool box are defective, what is the probability of taking out exactly two defectives tools?

(A) $\frac{1}{40}$
(B) $\frac{3}{20}$
(C) $\frac{7}{40}$
(D) $\frac{7}{20}$
(E) $\frac{21}{40}$

9. The probabilities of selecting a number out of four different numbers are P_1, P_2, P_3, P_4 for the four numbers. Which of the following could be the individual values of the four probabilities?

(A) $P_1=0.4$; $P_2=0.3$; $P_3=0.2$; $P_4=0.2$
(B) $P_1=0.4$; $P_2=0.25$; $P_3=0.2$; $P_4=0.25$
(C) $P_1=0.2$; $P_2=0.25$; $P_3=0.4$; $P_4=0.15$
(D) $P_1=0.3$; $P_2=0.2$; $P_3=0.4$; $P_4=0.2$
(E) $P_1=0.5$; $P_2=0.3$; $P_3=0.2$; $P_4=0.1$

10. 6 balls are marked with numbers 1 to 6. If two balls are picked out of these 6 balls, what is the probability that the sum of the numbers on the balls is 8?

(A) $\frac{1}{15}$
(B) $\frac{2}{15}$
(C) $\frac{1}{5}$
(D) $\frac{4}{15}$
(E) $\frac{1}{3}$

11. If the probability that Ashley does the homework is $\frac{2}{3}$ and that of Barrack doing the homework is $\frac{4}{7}$, what is the probability that neither of them does the homework?

(A) $\frac{1}{7}$
(B) $\frac{4}{21}$
(C) $\frac{2}{7}$
(D) $\frac{8}{21}$
(E) $\frac{10}{21}$

12. If the probability of Andrew hitting the target while shooting is 0.8 and that of Bruce hitting the same target is 0.7, what is the probability that none of them hits the target?

(A) 0.01
(B) 0.06
(C) 0.14
(D) 0.24
(E) 0.44

13. Daniel invites 7 people to his Birthday party of which 3 are his school friends and 4 are his college friends. After the party gets over, he gives 2 identical gifts to two of his friends. What is the probability that he gives the two gifts to his college friends?

(A) $\frac{1}{7}$
(B) $\frac{2}{7}$
(C) $\frac{3}{7}$
(D) $\frac{4}{7}$
(E) $\frac{5}{7}$

14. A box contains 5 green balls, 3 black balls and 2 red balls. If 2 balls are taken out of the box successively without replacement, what is the probability that the two balls are red?

(A) $\frac{1}{45}$
(B) $\frac{2}{45}$
(C) $\frac{1}{15}$
(D) $\frac{4}{45}$
(E) $\frac{1}{9}$

15. If two distinct numbers are taken from 1,2,3,4...28, what is the probability that their sum is less than 13?

(A) $\frac{1}{21}$
(B) $\frac{4}{63}$
(C) $\frac{5}{63}$
(D) $\frac{1}{9}$
(E) $\frac{8}{63}$

16. The probability that Frances gets a line busy whenever she calls to Michael is 2/3. She makes one call to Michael on each of the 4 consecutive days.

Quantity A	***Quantity B***
Probability that Frances gets the line busy on each of the 4 days	$\frac{1}{4}$

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17. A pair of dice is rolled. What is the probability that the sum of numbers on the two dice is 8?

(A) $\frac{1}{9}$
(B) $\frac{5}{36}$
(C) $\frac{1}{6}$
(D) $\frac{7}{36}$
(E) $\frac{2}{9}$

18. A bag that has more than 30 marbles contains only red and black marbles. The number of red marbles in the bag is 5 times more than the number of black marbles. Five marbles are picked at random without replacement.

Quantity A	***Quantity B***
Probability of drawing only the red marbles	Probability of drawing only the black marbles

19. A box contains six balls numbered 1 to 6. Two balls are selected from the box, one after the other and with replacement. If the sum of the numbers on the balls picked is 10, what is the probability that one of the balls picked was numbered 6?

(A) $\frac{1}{6}$
(B) $\frac{1}{5}$
(C) $\frac{1}{3}$
(D) $\frac{2}{5}$
(E) $\frac{2}{3}$

20. If an integer n is chosen from the integers 1 through 72, what is the probability that $n(n+1)(n+2)$ will be divisible by 8?

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

21. $X = \{1, 2, 3, 4,5\}$
$Y = \{-9,-8,0, 1, 2, 3\}$

If an integer is to be randomly selected from set X and an integer is to be randomly selected from set Y, what is the probability that the product of the two integers selected will be positive?

(A) 0
(B) $\frac{2}{3}$
(C) $\frac{2}{5}$
(D) $\frac{1}{2}$
(E) $\frac{4}{5}$

22. In a toy manufacturing company the probability that the toy manufactured is defective is 0.1. For shipment purposes 5 toys are packed in a box. The shipment of the box of toys is only done if the inspection department of the company clears the box of toys after inspection. Due to strict government regulatory guidelines the inspection department of the company rejects the box of toys for shipment even if one of the toys is defective. What is the probability that the box of toys will be not be cleared for shipment by the inspection department of the toy manufacturing company?

(A) 0.1
(B) 0.15
(C) $1-(0.1)^5$
(D) $1-(0.9)^5$
(E) 1

23. A class containing 20 students has equal number of boys and girls. A teacher will select 7 students to volunteer in a social service program. If the first six selected students are girls, what is the probability that the seventh student selected is also a girl?

(A) $\frac{2}{7}$
(B) $\frac{4}{7}$
(C) $\frac{1}{2}$
(D) $\frac{3}{2}$
(E) 1

24. Probability of raining on Tuesday, Wednesday and Thursday is $\frac{1}{6}$ for each day, probability of raining on Monday is $\frac{2}{5}$ and that for Friday is $\frac{4}{5}$. What is the probability that the rain will occur on at least one of the given five days?

(A) $\frac{5}{72}$
(B) $\frac{7}{72}$
(C) $\frac{13}{72}$
(D) $\frac{67}{72}$
(E) 1

25. The Probability that Adam hits the target is 0.4, for Ben the probability of hitting the same target is 0.7. What is the probability that both Adam and Ben do not hit the target?

(A) 0.12
(B) 0.18
(C) 0.25
(D) 0.36
(E) 1

For Question 26, select <u>all</u> the answer choices that apply.

26. The odds against A being selected for a job are 3:5 and the odds in favor of B being selected are 5:6. If the chances that A and B are selected for the job are independent of each other, then which of the following options are true?

(A) the probability that A is selected is 3/8
(B) the probability that B is not selected is 6/11
(C) the probability that both are selected is 9/44
(D) the probability that only one of them is selected is 45/88

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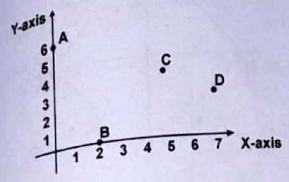
27. Two candidates A and B attend an interview. The probability that A and B are selected is 0.3 and 0.7 respectively. The probability that only one of A, B is selected in the interview is

COORDINATE GEOMETRY AND FUNCTIONS

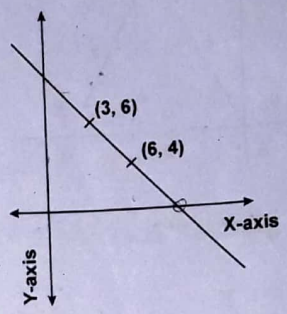


1. Which of the two points in the above graph gives a slope of -3 when they are joined?

(A) A and B
(B) A and C
(C) B and C
(D) C and D
(E) B and D

2. The equation, $y=x^2-3$ represents a parabola that intersects y-axis at the point Q. If P is a point on the parabola having coordinates $(2, k)$, what is the distance between the point P and the point Q?

(A) 6
(B) 7
(C) $2\sqrt{5}$
(D) $3\sqrt{3}$
(E) 9



3. What is the y-intercept of the line shown in the above figure?

(A) 7
(B) 8
(C) 9
(D) 10
(E) 12

4. $f(n) = [(-1)^n] \times c \times n$, where '$c$' is the cost. Difference between the largest and smallest among $f(1)$, $f(2)$ and $f(3)$ is 20.

Quantity A	Quantity B
$f(4)$	16

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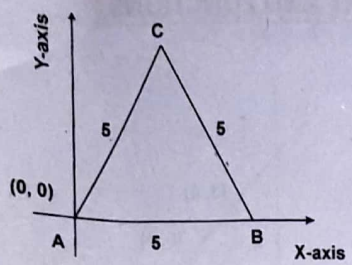


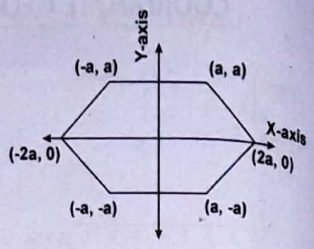
5. In the figure above, what is the slope of line segment BC?

(A) $-\frac{1}{\sqrt{3}}$
(B) $-\frac{1}{\sqrt{2}}$
(C) -1
(D) $-\sqrt{2}$
(E) $-\sqrt{3}$

6. Equation of a line k is given as $ax + by + c = 0$. Which of the following must be true?

I. If a is positive then x intercept of line k is positive.
II. If b is positive then slope of line k is positive
III. If a and b are negative then slope of line k is negative

(A) I only
(B) II only
(C) III only
(D) II and III
(E) I and III



7. What is the area of the polygon shown in the above figure?

(A) $3a^2$
(B) $5a^2$
(C) $6a^2$
(D) $7a^2$
(E) $9a^2$

8 In a rectangular co-ordinate system, the point (u, v) lies in the second quadrant and the point (x, y) lies in the third quadrant.

Quantity A	Quantity B
$x + y$	$u + v$

9. The slope of a straight line passing through the point with coordinates (30,50) is 2.5

Quantity A	Quantity B
y-intercept of the given straight line	-25

10. The area of a triangle having vertices at the points (k, k), $(k + 4s, k)$ & $(k, k + s)$ is 32

Quantity A	Quantity B
s	4

11. Points A, B & C having coordinates (2, 4), (5, 3) & $(k, 1)$, respectively, are collinear. What is the value of k?

(A) 1
(B) 5
(C) 9
(D) 11
(E) 12

12. What is the distance between the two straight lines represented by the equations $3x + 4y = 10$ & $6x + 8y = 10$?

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

13.

Quantity A	Quantity B
Distance of the origin from the point (x, y)	Distance of the origin from the point $(1-x, 1-y)$

14. Two straight lines l and m pass through the point (1, 1). Slope of line l passing through the point (0, a) is less than the slope of the line m that passes through the point (0, b)

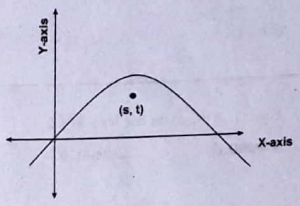
Quantity A	Quantity B
a	b

15. The y-coordinate of the point of intersection of the two straight lines represented by the equations $y = ax + b$ & $y = cx + d$ is

(A) 0
(B) $\frac{b-d}{a-c}$
(C) $\frac{bc-ad}{c-a}$
(D) $\frac{a-b}{c-d}$
(E) 0

16. What is the area of the triangle formed by the three points (0, 0), (2, 4) and (4, 2)?

(A) 3
(B) 6
(C) 8
(D) 9
(E) 12



17. The equation of the parabola shown in the figure above is $y = 2x - x^2$.

Quantity A	Quantity B
t	$2s - s^2$

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18. The slope and x-intercept of the line $y = ax + b$ are 2 and 5 respectively.

Quantity A	Quantity B
y-intercept	-10

19. The x-intercept of the line having a slope of -1 and passing through the point (1, 2) is

(A) -3
(B) 0
(C) -1
(D) 1
(E) 3

20. If the four points (1, 6), (5, 6), (1, 3) & (5, 3) lying in the xy-plane are joined to form a rectangle, then which of the following points lies inside the rectangle?

(A) (2, 2)
(B) (4, 4)
(C) (5, 2)
(D) (6, 6)
(E) (6, 8)

21. Point (1, 2) lies on the line $Mx + Ky = 2$.

Quantity A	Quantity B
k	0

22. The area of the triangle formed by the straight line $x + y = 4$ with X-axis and Y-axis is

(A) 1
(B) 4
(C) 8
(D) 10
(E) 16

23. The straight line having a slope of $\frac{5}{3}$ passes through the point (3, 5). The given straight line will also pass through which of the following points?

(A) (5, 3)
(B) (0, 0)
(C) (0, 3)
(D) (3, 0)
(E) (2, 3)

24. Line l is represented by the equation $ax + by + c = 0$, where $a > 0$ & $b > 0$

Quantity A	Quantity B
Slope of the line l	0

25. The two points P and Q having coordinates (6, 0) and (0, 8) respectively, are situated at the two opposite ends of a circle C. The radius of circle C is

(A) 10
(B) 20
(C) 5
(D) 2
(E) 4

26. A straight line l in the xy-plane has a slope of $-\frac{1}{2}$.

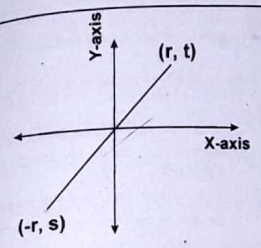
Quantity A	Quantity B
x-intercept of line l	y-intercept of line l

27. A circle C having center at the point (5, -3) cuts the x-axis at the points (4, 0) and (6, 0).

Quantity A	Quantity B
Circumference of the circle C	10π

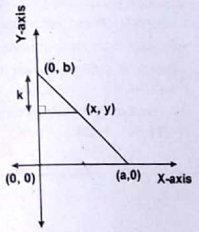
28. In the xy-rectangular coordinate system, if a line passes through the points (–10, –18), (20, 22) and (x, 2), then what is the value of x?

(A) 1
(B) 3
(C) 5
(D) 7
(E) 10



29.

Quantity A	Quantity B
value of $-s$ in the above figure	value of t in the above figure



30. In the above figure, what are the values of x and y?

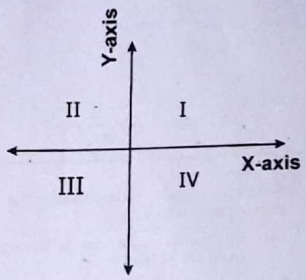
(A) $x = ak/b$; $y = b - k$
(B) $x = a$; $y = b$
(C) $x = a/b$; $y = b - k$
(D) $x = a/bk$; $y = b$
(E) $x = ak/b$; $y = b + k$

31. Slope of line $k = -\frac{2}{3}$

Quantity A	Quantity B
x-intercept of line k	y-intercept of line k

32. What is the y-intercept of the line passing through the points (2, 4) and (5, 3)?

(A) $\frac{8}{3}$
(B) $\frac{10}{3}$
(C) $\frac{14}{3}$
(D) $\frac{16}{3}$
(E) $\frac{20}{3}$



33. In the rectangular coordinate system, which quadrant/s may contain point (x, y) that satisfies the inequality $x + 3y < 1$?

(A) I only
(B) I and II only
(C) III and IV only
(D) I, II and IV only
(E) I, II, III and IV

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For Questions 34 - 43, select all the answer choices that apply.

34. In which of the following options, the angle between two straight lines could be found?

(A) The equations of the two straight lines are $4x + 6y + 2 = 0$ and $6x + 9y + 10 = 0$.

(B) The angle between the sides AB and AC in triangle ABC, whose lengths are 3 and 4.

(C) The angle between the sides of the triangle, the side opposite of which lies on the diameter of a circle

(D) None of the options above.

35.

36. Which of the following will be sufficient to find the slope of a straight line L?

(A) the area of the triangle formed by three points on the straight line L is 0.

(B) One point on the line L is $(x, 0)$ and another point on the line L is $(0, y)$

(C) the straight line L is parallel to a line whose equation is $2x+3y = 0$

37. Points A (4, 6), B (8, 10) and C (12, 14) are in the rectangular coordinate system formed by the x-axis and y-axis. Which of the following options are true?

(A) The area of the triangle formed by the three points A, B and C is zero

(B) Points A, B and C lie on a same straight line

(C) the slopes of any two pair of points among the three points A, B and C are same

38. The equations of two straight lines are:

$L \Rightarrow 6x + 4y + 5 = 0$ and $M \Rightarrow 9x + 6y = 0$.

Which of the following answer options are true?

(A) the angle between the two straight lines L and M is 0^0

(B) the two straight lines L and M do not intersect

(C) the straight line M passes through origin

(D) None of the options above.

39. The slope of a straight line is $\frac{2}{3}$. Which of the following options may be true?

(A) x-intercept is greater than y-intercept

(B) y-intercept is greater than x-intercept

(C) x-intercept is definitely greater if y-intercept is negative

(D) x-intercept and y-intercept of the straight line are opposite in sign.

40. The equation of a straight line L is $2x + 4y = 0$. Which of the following options must be true?

(A) Line L contains the point P (0, 0) on it.

(B) The straight line L does not pass through the points that lie in the first and third quadrants

(C) The straight line L does not pass through the quadrant in which the point P (-2, 1) lies

(D) The x-coordinates and the y-coordinates of points lying on the line L are always of opposite sign

41. The two points P $(p, 2)$ and Q $(3, q)$ lie in the rectangular coordinate system formed by the x-axis and the y-axis. If $pq \neq 0$, then which of the following options are possibly true?

(A) Points P and Q are in 1st and 4th quadrants respectively if $pq > 0$

(B) Points P and Q are be in 3rd and 4th quadrants respectively if $pq > 0$

(C) Points P and Q are in 3rd quadrant and 4th quadrant respectively if $pq < 0$

(D) None of the options above.

42. A straight line L passes through the 2nd and 4th quadrants. The point (4, -4) lies on the straight line. Which of the following options are true?

(A) The point P(-3, 5) in the 2nd quadrant lies to the right of the line L

(B) The point P (-3, 5) in the 2nd quadrant lies to the left of the line L

(C) The point P (-2, 2) lies on the line L

(D) The point P (3, -4) lies in the 4th quadrant between the lower y-axis and the line L

43. The three points P(x, 2), Q (3, 4) and R (6, 7) lie on a same straight line L. then the value of x is

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SPEED, TIME, DISTANCE AND WORK RATE

1. A tank contains 'G' gallons of water. If the water fills the tank at the rate of x gallons/hour and leaks out of the tank at the rate of y gallons /hour (where, $y > x$), what is the time taken to empty half of the tank (i.e. $\frac{G}{2}$ gallons) in terms of x and y?

(A) $\frac{G}{y}$
(B) $\frac{G}{y-x}$
(C) $\frac{G}{2(y-x)}$
(D) $\frac{3G}{4(y-x)}$
(E) $\frac{G}{y+x}$

2. A group of four pumps is designed to fill a tank such that three pumps work at $\frac{2}{3}^{rd}$ the rate of the fourth pump. If all 4 pumps work at the same time, they should fill the tank in what fraction of the time taken by the largest pump working alone?

(A) $\frac{1}{6}$
(B) 1/5
(C) $\frac{1}{3}$
(D) $\frac{2}{5}$
(E) $\frac{1}{2}$

3. Water runs into a cylindrical cistern at the rate of 924 m^3 per minute. If the water level rises to 0.1 meter in one second, what is the radius of the cistern?

(A) 5
(B) 7
(C) 8
(D) 10
(E) 11

4. Seven persons can finish a painting a wall in 140 hours working together. Four of these people take 'h' hours each and the remaining persons take 2h hours each to complete the same amount of work when any one of them works alone. What is the difference between the median and the mean measures of the individual working times of the different people?

(A) 6
(B) 30
(C) 84
(D) 330
(E) 500

5. 10 machines work for 8 hours to produce 200 pairs of shoes. How many hours will 24 machines take to produce 180 pairs of shoes provided that the rate of all the machines is same?

(A) 1.5
(B) 2.5
(C) 3
(D) 4.5
(E) 6

6. Pat takes 4 hours to complete a work, Quinn takes 6 hours and Rob takes 8 hours to complete the same amount of work when they work alone. If the three people work together to complete the same work, approximately what percentage of the total work is done by Pat?

(A) 42%
(B) 46%
(C) 50%
(D) 54%
(E) 60%

7. Tom was travelling on national highway at 55 miles per hour when he passed by a milestone showing 2992 miles to Boston. What is the time required (in hours) by him from now on to travel to the milestone showing the next palindrome?

(A) 0.2
(B) 2
(C) 52.4
(D) 54.4
(E) 54.6

8. Walking $\frac{6}{7}^{th}$ of his usual speed, Chris is 12 minutes late to his destination. The usual time taken by him to cover the total distance for his destination is

(A) 48 minutes
(B) 60 minutes
(C) 72 minutes
(D) 84 minutes
(E) 96 minutes

9. Andy and Ben can finish painting a wall in x hours working together. Andy takes y hours more than Ben to finish the same work when both of them work alone.

Quantity A	***Quantity B***
Number of hours that Ben takes to finish the same work alone	$\frac{x-y}{2}$

10. Joseph travels the first $\frac{2}{3}$ of the distance to his home on bicycle and the remaining distance on foot. What is the ratio of the Joseph's speed on the bicycle to his speed on foot if he takes three times as long on foot as on the bicycle?

(A) 1:6
(B) 1:3
(C) 2:1
(D) 3:1
(E) 6:1

11. Time taken to travel X miles is t seconds.

Quantity A	***Quantity B***
The time taken in seconds to travel 900 miles	$\frac{15t}{X}$

12. A car goes along the circumference of a circle of radius 14 miles. The car travels the first round at a speed of 11 miles per hour. The speed of the car increases by 11 miles per hour for every successive round. Which of the following fractions, in mixed form, represents the total time taken by the car to cover a total distance of 440 miles?

(A) $14\frac{8}{5}$
(B) $15\frac{14}{18}$
(C) $18\frac{4}{15}$
(D) $4\frac{15}{18}$
(E) $7\frac{4}{15}$

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13. A car covers x/6 miles in y seconds. What should be the speed of the car, in miles per second, to cover z miles in y seconds?

(A) $\frac{x}{6y}$
(B) $\frac{zx}{y}$
(C) $\frac{z}{y}$
(D) $\frac{zx}{6y}$
(E) $\frac{x}{6z}$

14. Peter takes 2 minutes to walk along the circumference of a semi-circle, while Beth takes 1 minute to travel along the diameter of the same semi-circle.

Quantity A	***Quantity B***
Average speed of Peter	Average speed of Beth

15. A plane flies between two cites M and P, first from M to P and then from P to M. Distance between city M and city P is 500 miles. The speed of the plane from M to P is 500 mph and that from P to M is 400 mph.

Quantity A	***Quantity B***
The average speed of the plane for the complete journey	450 mph

16. Which of the following represents the approximate value of the distance covered by Annie in 18 minutes, if her speed is 3 mph? (1mile = 5208 feet)

(A) 4000 feet
(B) 4250 feet
(C) 4500 feet
(D) 4700 feet
(E) 5000 feet

17. If a plane travels $100x$ miles in t seconds, how many hours will it take to travel a distance of y miles?

(A) $\frac{y}{360,000x}$
(B) $\frac{yt}{360,000x}$
(C) $\frac{t}{360,000xy}$
(D) $\frac{yt}{6000x}$
(E) $\frac{yt}{100x}$

18. Water flows into a cylindrical tank at the rate of 1000 cubic inches/min. If the water level rises in the tank at the rate of 0.1 inches/min, what is the radius (in inches) of the cylindrical tank?

(A) $\frac{25}{\sqrt{\pi}}$
(B) $\frac{50}{\sqrt{\pi}}$
(C) $\frac{100}{\sqrt{\pi}}$
(D) $\frac{200}{\sqrt{\pi}}$
(E) $\frac{400}{\sqrt{\pi}}$

19. Jake travels from city M to city P that are 500 miles apart at an average speed of 400miles/hr and travels back from city P to city M at an average speed of 500miles/hr. What is the average speed of Jake for the round trip?

(A) 444.4 miles/hr
(B) 460 miles/hr
(C) 474.6 miles/hr
(D) 492 miles/hr
(E) 500 miles/hr

20. A plane travels 100 miles in a second. How much distance will it cover in one hour?

(A) 360,000 miles
(B) 480,000 miles
(C) 600,000 miles
(D) 720,000 miles
(E) 840,000 miles

21. Alice and Beth worked for 10 hrs on a certain day and produced 5000 books. On the next day Alice worked for 5 hrs and Beth worked for 4hrs working at the same rates as the previous day.

Quantity A	***Quantity B***
Number of books produced by Alice and Beth on the second day	4500

22. Antonia drove half of her journey to her destination at an average speed of 35miles/hour for 12 hours. If she has to reach her destination in T hours, which of the following should be her average speed for rest of her journey?

(A) $\frac{(35)(12)}{(T - 12)}$
(B) $\frac{35}{T - 12}$
(C) $\frac{12}{T - 12}$
(D) $\frac{35}{12(T - 12)}$
(E) $\frac{T - 12}{(12)(35)}$

23. A watch gains 7 minutes and 6 seconds every 6 days. If the rate of gain is constant, how much time does the watch gain in 1 day?

(A) 1 minute
(B) 1 minute and 6 seconds
(C) 1 minute and 11 seconds
(D) 1 minute and 23 seconds
(E) 1 minute and 30 seconds

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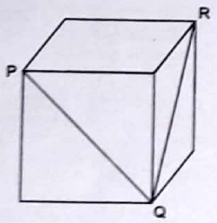
GEOMETRY

1. Lengths of three sides of a triangle are 5, 6 and 8. Degree measure of the angles opposite to the sides with lengths 5 and 6 are 'x' and 'y' respectively.

Quantity A	***Quantity B***
$x + y$	90°

2. Perimeter of a small rectangular park is 560 feet and measure of its diagonal is 200 feet. What is the area of the park in square feet?

(A) 19,200
(B) 19,600
(C) 20,000
(D) 20,400
(E) 20,800



3. For the cube shown in the figure above, what is the degree measure of $\angle PQR$?

(A) 30°
(B) 45°
(C) 60°
(D) 75°
(E) 90°

4. How many sides does a polygon having 27 diagonals have?

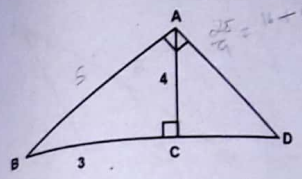
(A) 5
(B) 6
(C) 7
(D) 8
(E) 9

5. $x < y < z$, where x, y & z are the lengths of the edges of a cuboid

Quantity A	***Quantity B***
Volume of the cuboid with edges having lengths $(x+10)$, y & z	Volume of the cuboid with edges having lengths x, y & $(z+10)$

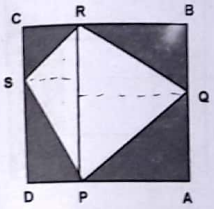
6. P & Q are two different points on line l and R & S are two different points on line m. Line l is parallel to line m and the distance between P & Q is same as the distance between R & S. Point 'T' is the mid-point of line segment PQ.

Quantity A	***Quantity B***
Distance from T to R	Distance from T to S



7. In triangle ABC shown in the above figure, $BC = 3$ and $AC = 4$. What is the length of the line segment CD?

(A) 3
(B) $\frac{15}{4}$
(C) 5
(D) $\frac{16}{3}$
(E) $\frac{20}{3}$



8. In the above square $ABCD$, PR is parallel to CD and the length of CD is 10.

Quantity A	***Quantity B***
Area of the shaded region in the above figure	50

9. What is the distance between two lines represented by the equations, $x + y = 5$ & $x + y = 4$?

(A) $\frac{1}{2}$
(B) $\frac{\sqrt{2}}{2}$
(C) $\sqrt{2}$
(D) 2
(E) $\frac{20}{3}$

10. Smallest distance from a point P to any point on the circle C is 5 and the largest distance from the point P to any point on the circle C is 11. If point P is situated outside the circle C, then what is the distance between centre of the circle C and the point P?

(A) 2
(B) 3
(C) 5
(D) 7
(E) 8

11. Triangle SRT is an isosceles triangle with length of side SR equal to that of side ST. If P is a point on the side RT, that has different distances from the points R and T, which of the following must be true?

I. $SP < SR$
II. $SP > RP$
III. $SP < RT$

(A) I only
(B) II only
(C) III only
(D) I and II
(E) II and III

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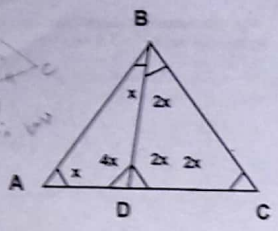
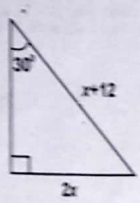


12. **Quantity A** — Area of triangle *ADB*

Quantity B — Area of triangle *BDC*



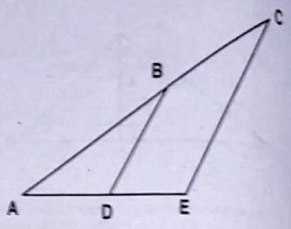
13. What is the area of the right angled triangle shown in the figure above?

(A) $16\sqrt{3}$
(B) 32
(C) $32\sqrt{3}$
(D) 48
(E) $48\sqrt{2}$

14. Surface area of a cube is 36.

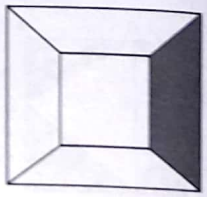
Quantity A — Volume of the cube

Quantity B — 15



15. In the triangle shown above, *BD* is parallel to *EC*. If $AC = 15$, $BC = 5$ & $AD = 5$, what is the length of *ED*?

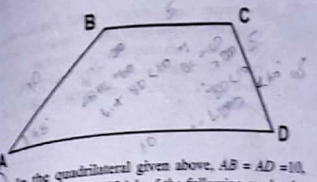
(A) 1.5
(B) 2.5
(C) 3.5
(D) 4.5
(E) 5



16. Figure shown above consists of two squares having the same centers. Sides of the inner square, each of length 4 units, are parallel to the sides of the outer square each having length of 12 units.

Quantity A — Perimeter of the shaded region

Quantity B — Area of the shaded region



17. In the quadrilateral given above, $AB = AD = 10$, $BC = CD = 5$. Which of the following can be the value of the angle *BAD*?

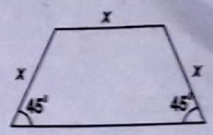
(A) 45
(B) 60
(C) 75
(D) 90
(E) 122.5

18. A cylinder has radius 5 and height 8. What is the largest distance between any two points on the cylinder?

(A) $8\sqrt{2}$
(B) $8\sqrt{5}$
(C) $\sqrt{41}$
(D) $2\sqrt{41}$
(E) 13

19. Radius of the semi-circle shown above is 1. What is the area of the shaded region?

(A) $\frac{\pi}{6} - \frac{1}{4}$
(B) $\frac{\pi}{6} - \frac{\sqrt{3}}{4}$
(C) $\frac{\pi}{4} - \frac{\sqrt{3}}{4}$
(D) $\frac{\pi}{6} + \frac{1}{4}$
(E) $\frac{\pi}{4} + \frac{1}{4}$



20. What is the perimeter of the quadrilateral shown above?

(A) $(4\sqrt{2})x$
(B) $(4+\sqrt{2})x$
(C) $(4+2\sqrt{2})x$
(D) $5x$
(E) $6x$

21. In triangle *ABC*, point *D* divides the side *AB* such that $\frac{AD}{DB} = \frac{1}{3}$. If the area of the triangle *ABC* is '*r*', then what is the area of the triangle *ADC* in terms of '*r*'?

(A) $\frac{r}{2}$
(B) $\frac{r}{3}$
(C) $\frac{2r}{3}$
(D) $\frac{r}{4}$
(E) $\frac{3r}{4}$

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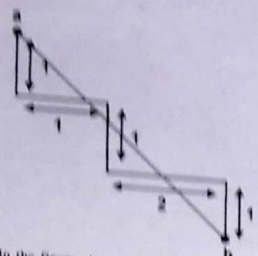


22. In the figure above, each of the two consecutive lines are perpendicular to each other. What is the distance between 'a' and 'b'?

(A) $2\sqrt{2}$
(B) $3\sqrt{2}$
(C) $4\sqrt{2}$
(D) $5\sqrt{2}$
(E) $2\sqrt{3}$

23. A square is formed by joining midpoints of another square. Perimeter of the larger square is X.

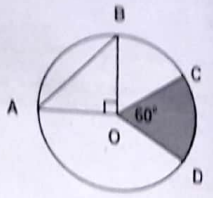
Quantity A	Quantity B
Perimeter of smaller square	$\frac{X}{2}$

24. Circle C having radius 13 intersects circle P with radius 15 at two different points. If the distance between the two intersecting points for the two circles is 24, then what is the distance between the centers of the two circles?

(A) 11
(B) 12
(C) 13
(D) 14
(E) 15

25. Two circles P and Q are concentric. The inner circle is a garden of radius 6 feet and the outer circle which has a cement path around the garden has a radius 8 feet. If the width of cement is 0.03 feet, what is the volume in cubic feet of the cement used for the cemented path?

(A) 4
(B) 4.4
(C) 4.8
(D) 5
(E) 5.5



26.

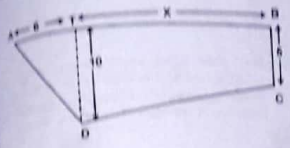
Quantity A	Quantity B
Area of the triangle AOB	Area of the shaded region

27. A cube painted red on all its faces is cut into 125 equal cubes. How many of these smaller cubes will have none of its faces painted red?

(A) 20
(B) 27
(C) 50
(D) 81
(E) 100

28. In a triangle PQR, the lengths of two sides are $QR = 12$, $PR = 13$. The perimeter of the triangle is 32.

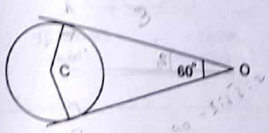
Quantity A	Quantity B
Value of angle Q	90°



29. If the area of the quadrilateral $ABCD$ in the above figure is 180 and TD, the shortest distance of the side AB from vertex D, is parallel to BC, what is the value of X?

(A) 10
(B) 15
(C) 20
(D) 25
(E) 28

30. In the figure below, the two tangents to the circle having centre at the point C, meet at the point O. What is the area of the circle if the length of the tangents from the point O to the circle is 3 inches?



(A) π
(B) 2π
(C) 3π
(D) 4π
(E) 5π

31. Two tangents to a circle having center at O meet the circle at points A and B. The two tangents meet each other at a point C outside the circle. Angle ACB is 50°.

Quantity A	Quantity B
Angle AOB	110

32. The volume of a cube is 1 cubic ft. The distance from any vertex to the centre of the cube (in feet) is

(A) $\frac{1}{2}$
(B) $\frac{1}{\sqrt{2}}$
(C) $\sqrt{2}$
(D) $\frac{\sqrt{3}}{2}$
(E) $\sqrt{3}$

33. The radius of a circle is 4 and the length of a chord in the circle is $4(\sqrt{3})$. What is the angle subtended by the chord at the centre of the circle?

(A) 30°
(B) 45°
(C) 60°
(D) 90°
(E) 120°

34. $X > 1$

Quantity A	Quantity B
Circumference of a circle with diameter having length X	Area of a circle with diameter having length X

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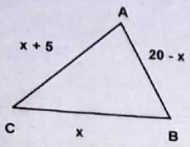
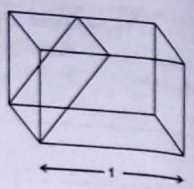
35. Two concentric circles P & Q have radii r & R, $r < R$. If area of the smaller circle is equal to the difference in the areas of the two circles, which of the following expresses r in terms of R?

(A) $\frac{R}{4}$
(B) $\frac{R}{3}$
(C) $\frac{R}{2}$
(D) $\frac{R}{\sqrt{2}}$
(E) $R\sqrt{2}$



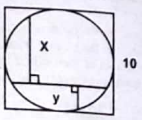
36. Which of the following values cannot be a possible value of x in the above triangle?

(A) 8
(B) 9
(C) 10
(D) 11
(E) 15



37. In the above figure, what is the ratio of the total surface area of the cube to the area of the rectangle formed by joining two vertices of the cube with the midpoints of two edges of the cube, as shown?

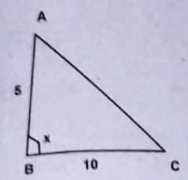
(A) $\frac{1}{6}$
(B) $\frac{12}{\sqrt{5}}$
(C) $\frac{\sqrt{6}}{12}$
(D) $\frac{1}{4}$
(E) $\frac{1}{3}$



38.

Quantity A	Quantity B
$(x + y)/2$	5

$x + y < 10$
$\frac{x+y}{2} < 5$



39. In the above figure, $x > 90$

Quantity A	Quantity B
Area of triangle ABC	25

40. The diameter of wheel A is half of the diameter of wheel B

Quantity A	Quantity B
Number of revolutions made by wheel A to cover 2500 miles	Number of revolutions made by wheel B to cover 5000 miles

41.

Quantity A	Quantity B
Interior angle of a polygon of 5 sides	Interior angle of a polygon of 6 sides

42. A, B and C are the three interior angles in a triangle such that $A < B < C$.

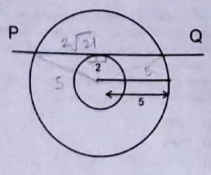
Quantity A	Quantity B
$A + B$	C

43. In triangle ABC, $AB = AC = 4$.

Quantity A	Quantity B
BC	5

44. A right circular cylindrical tank having a height of 2 feet and perimeter of the base as 22 feet was filled with water up to 80% of its actual capacity. What is the minimum number of lead balls each having radius of 0.10 feet, that should be dropped into the tank so as to increase the volume to at least 90%?

(A) 800
(B) 900
(C) 919
(D) 1838
(E) 2757



45. In the above figure, the radii of the concentric circles are 2 and 5 respectively. If the tangent to the smaller circle intersects the bigger circle at the points 'P' and 'Q', then what is the length of PQ?

(A) $\sqrt{21}$
(B) $2\sqrt{21}$
(C) $3\sqrt{21}$
(D) $4\sqrt{21}$
(E) $5\sqrt{21}$

$25 = x^2 + x$
$x = \sqrt{21}$

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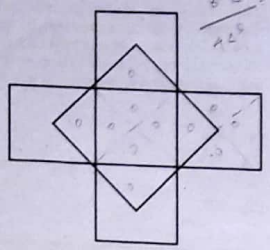
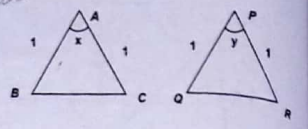


46. Four squares of equal sides are adjoined along the sides of a similar square as shown in the figure above. The centers of the adjoining squares are joined to give another square. The area of the new square formed is what percent more than the area of each of the adjoining squares?

(A) 20%
(B) 50%
(C) 75%
(D) 80%
(E) 100%

47. In a triangle PQR, the lengths of two sides are given as $QR = 12$ and $PR = 13$. The perimeter of the triangle is 32.

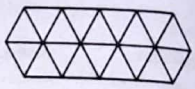
Quantity A	Quantity B
Measure of angle Q	90°



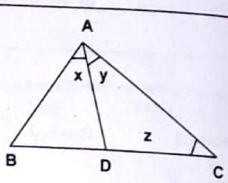
48. In the above figure, $x < y$.

Quantity A	Quantity B
Area of the triangle ABC	Area of the triangle PQR

49. Eighteen equilateral triangles are joined together as shown in the figure below. If the length of the sides of each triangle is 1, what is the perimeter of the whole figure?

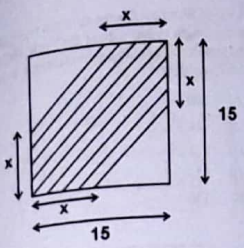


(A) 10
(B) 11
(C) 12
(D) 13
(E) 14



50. In the above figure, AB < BD

Quantity A	Quantity B
$\frac{x+y}{2}$	$\frac{y+z}{2}$



51. In the above figure, the area of the shaded region is 75% of the area of the square. What is the value of x?

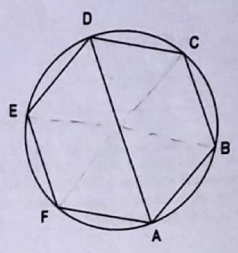
(A) 5.5
(B) 6.5
(C) 7.5
(D) 8.5
(E) 9.5

52. A puzzle board is in the form of an equilateral triangle that has an area of $7\sqrt{3}$ square inches. If the puzzle board is placed on a circular table, what should be the minimum area of the table so that whole of the board fits inside the table?

(A) 30
(B) $\frac{88}{3}$
(C) 22
(D) $\frac{44}{3}$
(E) 11

53. A triangle is inscribed in a circle with one of its sides exactly on the diameter of the circle. If one of the legs of the triangle is 5 and area of the triangle is 20, what is the area of the circle?

(A) $\frac{450}{7}$
(B) $\frac{979}{14}$
(C) $\frac{500}{7}$
(D) $\frac{1019}{14}$
(E) 100



54. In the above figure, a regular hexagon is inscribed in the circle in which AD is the diameter.

Quantity A	Quantity B
AD	$AF + FE$

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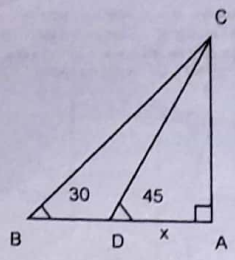


55. In the above figure, if $AD = 3$, what is the perimeter of triangle ABC?

(A) 12
(B) 13
(C) $9 + \sqrt{3}$
(D) $9 + \sqrt{27}$
(E) 15

56. 16 cylindrical cans, each having radius of one inch, are placed inside a rectangular box in a single column. If all the cans are placed in the upright position and fit exactly inside the box, what is the area of the base of the box?

(A) 16
(B) 32
(C) 64
(D) 100
(E) 128

57. Three points A, B and C are equidistant from each other and the points A and B lie on the same line l. Which of the following must be true for the given three points?

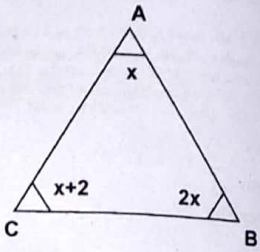
(A) None of the points lie in the same plane.
(B) Only one point lies in the plane.
(C) Only two points lie in the plane.
(D) More than two points lie in the plane.
(E) None of the above.

58. $A + L = 130$, where A is the area of a rectangle and L is the length of one side of the same rectangle. If the length of other side of the rectangle is 6, what is the value of A?

(A) 100
(B) 111.14
(C) 122.28
(D) 125
(E) 130

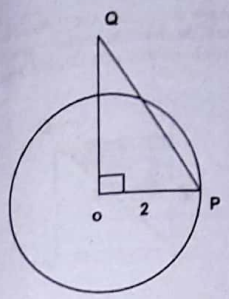
59. Two parallel lines l and m are cut by a transversal at the points B and A respectively. E is a point on line m such that measure of angle BAE is 58°. C is a point on line l on the other side of the transversal as E such that $BC = CA$.

Quantity A	Quantity B
Angle BCA	60°



60. What is the value of the greatest angle in the above figure?

(A) 85°
(B) 87°
(C) 89°
(D) 91°
(E) 99°



61. In the above figure, the areas of the circle and the triangle shown are 4π and 3 respectively. What is the length of the line segment PQ?

(A) 3
(B) $\sqrt{12}$
(C) $\sqrt{13}$
(D) $\sqrt{15}$
(E) 4

62. An isosceles triangle is drawn on the diameter of a circle as the base with the third vertex lying on the circumference of the circle.

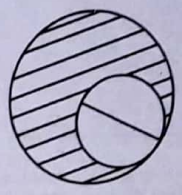
Quantity A	Quantity B
The area of the given triangle	The area of the region that is outside the given triangle but inside the circle

63. The sides of a right-angled triangle are n, $2n$-1, $2n$+1. What is the length of the hypotenuse, if n is a positive integer?

(A) 8
(B) 12
(C) 15
(D) 17
(E) 18

64. A square is inscribed in a circle. The diameter of the circle is equal to diagonal of the square. If the radius of the circle is 10, then what is the area of the square?

(A) 50
(B) 100
(C) 150
(D) 200
(E) 250



65. The diameter of the larger circle in the figure shown above is x. What is the area of the shaded region, if the radius of the smaller circle is half of the radius of the larger circle?

(A) $\frac{2\pi x^2}{16}$
(B) $\frac{3\pi x^2}{16}$
(C) $\frac{4\pi x^2}{16}$
(D) $\frac{3\pi x}{4}$
(E) πx

66. Three angles of a triangle are $2x$, x and $x + 20$, then the measure of the greatest angle is

(A) 60°
(B) 70°
(C) 80°
(D) 90°
(E) 100°

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67. A cube of volume 125 cubic feet is inscribed into a cylinder.

Quantity A	Quantity B
Volume of cylinder	$\frac{125\pi}{2}$

68. A square is cut into 25 smaller equal squares. How many of the smaller squares had only one of their sides along the perimeter of the bigger square?

(A) 11
(B) 12
(C) 13
(D) 14
(E) 15

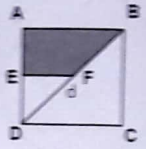
69. The diameter and the height of a circular cylinder are 20 feet and 4 feet respectively. What is the volume of water, in gallons, if the given cylinder is filled to a height of 3 feet and 6 inches? (1 foot = 12 inches; 1 gallon = 25% cubic inches)

(A) $\frac{56700}{7}$
(B) $\frac{57600}{7}$
(C) $\frac{58600}{7}$
(D) $\frac{58700}{7}$
(E) $\frac{59600}{7}$

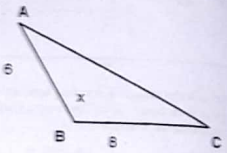
70. The adjacent sides of a parallelogram are 10 and 8.

Quantity A	Quantity B
Length of a diagonal of the given parallelogram	8

71. Each side of the square $ABCD$ shown below is 10. What is the area of the shaded region, if E and F are mid-points of the sides AD and BD respectively?

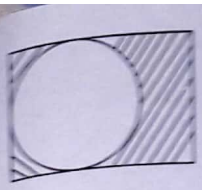


(A) 75
(B) 37.5
(C) 25
(D) 18.75
(E) 15



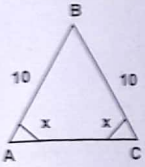
72. In the above figure $AB = 6$ and $BC = 8$

Quantity A	Quantity B
Area of triangle ABC	24



73. In the figure above, the length and the breadth of the rectangle are 6 cms and 4 cms respectively. What is the area of the shaded region, if the circle shown in the figure touches exactly three sides of the rectangle, as shown?

(A) $\frac{8\pi}{7}$
(B) π
(C) $\frac{8\pi}{9}$
(D) 8
(E) $\frac{8\pi}{11}$

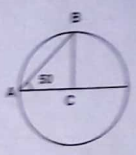


74. In triangle ABC shown above, $AB = BC = 10$ and angles A and C are equal to x.

Quantity A	Quantity B
AC	10

75. The sides of a triangle are x, y and z. If $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$ (perimeter of the triangle $\Delta = x + y + z$). What is the perimeter of the triangle?

(A) 12
(B) 14
(C) 16
(D) 18
(E) 20



76. What is the angle subtended by the minor arc AB at the center C of the circle in the above figure, if $\angle A = 50°$?

(A) 70°
(B) 80°
(C) 90°
(D) 100°
(E) 110°

77. The area of a rectangular region enclosed by a wire is 1350 sq. yards. The length of the rectangular region is 15 yards more than the width of the region. What is the length of the wire in feet, required for fencing the rectangular region?

(A) 250
(B) 300
(C) 350
(D) 400
(E) 450

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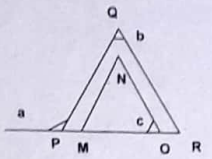
78. In triangle ABC, $AB = AC$ and angle $A = 60°$. A semicircle with diameter along the side BC is drawn. If length of the arc of the semi-circle is 50π, what is the perimeter of the triangle?

(A) 100
(B) 200
(C) 300
(D) 400
(E) 500



79. In the above figure a, b and c are measures of the three angles as shown & RQ is parallel to NO and PQ is parallel to MN.

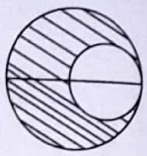
Quantity A	Quantity B
a	$b + c$

80. Two lines m and n are parallel to each other and a line k intersects them. How many points are there in the same plane that have equal distances from all the three lines?

(A) 1
(B) 2
(C) 3
(D) 4
(E) infinite

81. A triangle is adjoined to a side of a square as its base. If the areas of the triangle and the square are equal, what is the length of the altitude of the triangle in terms of s, the length of each side of the square?

(A) s
(B) $2s$
(C) $3s$
(D) $4s$
(E) $5s$



82. In the figure above, the radius of the larger circle is twice the radius of the smaller circle. How many times is the area of the shaded region more than the area of the unshaded region?

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

83. A circle with centre 'O' has diameter of length D. AB is a chord on the circle.

Quantity A	Quantity B
Perimeter of triangle OAB	$\frac{5d}{3}$

84. Width of a rectangle is 75% of its length. If the perimeter of the rectangle is 280, what is the length of its diagonal?

(A) 50
(B) 75
(C) 85
(D) 90
(E) 100

85. The volume of cylinder A with radius R and height H is K. What is the volume of another cylinder B whose radius & height are each double the radius & the height of cylinder A?

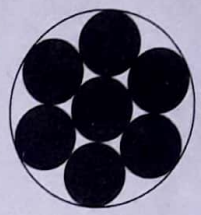
(A) $4k$
(B) $5k$
(C) $6k$
(D) $7k$
(E) $8k$

86. The three angles of triangle A have measures 90, x and y degrees and the angles of triangle B have measures of 90, z and w degrees. Which of the following conditions must be true for the two triangles?

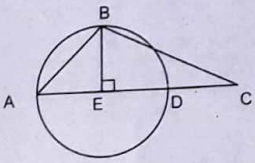
I. $x - w = z - y$
II. $x + y = w$
III. $z = 90 - w$

(A) I only
(B) II only
(C) I and III
(D) II and III
(E) I, II and III

87. In the figure below, what percent of the larger circle is unshaded, if all the circles inside the larger circle have the same area and they touch each other as shown?



(A) 20%
(B) 22.22%
(C) 24.33%
(D) 27%
(E) 44.44%



88. What is the area of the triangle ABC if D is the mid-point of EC and the area of the circle having center at the point E is 4π?

(A) 3
(B) 4
(C) 5
(D) 6
(E) 7

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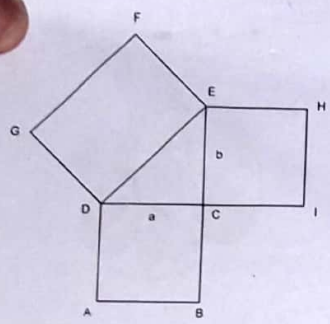


89. In the figure above, $AB = BC$, $CI = IH$ & $DE = EF$.

Quantity A	Quantity B
Area of Rectangle *GDEF*	Sum of areas of Rectangles *ABCD* & *CIHE*

90. Two tangents are drawn to the circle C, such that they meet each other at a point outside the circle making an angle of x degrees. If the angle subtended by the two points of contact at the centre of the circle C is 65°, what is x?

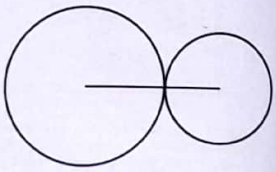
(A) 65
(B) 85
(C) 105
(D) 115
(E) 125

91. Perimeter of a parallelogram $ABCD$ is 36.

Quantity A	Quantity B
Length of diagonal AC	$9\sqrt{2}$

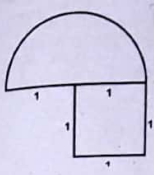
92. A 12 feet high sand mound is in the shape of a circular cylinder. If the volume of the sand in the mound is 96π, what is the area enclosed by the base of the mound?

(A) $\frac{156}{7}$
(B) $\frac{160}{7}$
(C) $\frac{167}{7}$
(D) $\frac{176}{7}$
(E) $\frac{276}{7}$



93. In the figure above, the ratio of the areas of the two circles touching each other as shown is 2 : 1. If the area of the bigger circle is π, what is the distance between the centers of the two circles?

(A) $\frac{1+\sqrt{2}}{2}$
(B) $\frac{2+\sqrt{2}}{2}$
(C) $\frac{3+\sqrt{2}}{2}$
(D) $\frac{2+2\sqrt{2}}{2}$
(E) 2

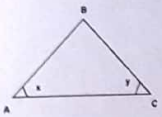


94. What is the perimeter of the figure shown above if arc shown is a semi circle?

(A) $\pi + 2$
(B) $\pi + 3$
(C) $\pi + 4$
(D) $2\pi + 3$
(E) $2\pi + 4$

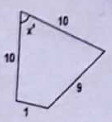
95. What is the value of x in the figure shown above?

(A) 72°
(B) 90°
(C) 105°
(D) 108°
(E) 120°



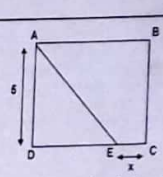
96. In the triangle shown, x and y are measures of the angles A and C, respectively, where $x + y > 90°$

Quantity A	Quantity B
AB	BC



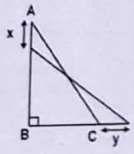
97.

Quantity A	Quantity B
value of x in the above figure	60



98. In the above figure, what is the ratio of area of triangle ADE to the area of square $ABCD$?

(A) $\frac{5-x}{10}$
(B) $\frac{x}{10}$
(C) $\frac{5+x}{10}$
(D) $\frac{5-x}{2}$
(E) $5 - x$



99. As shown above in the figure, AC is a ladder that slides downwards against the wall AB.

Quantity A	Quantity B
x	y

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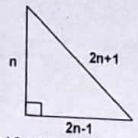
100. P, Q & R are 3 points in a plane. The length of the line segment PQ is 15 and that of line segment QR is 10.

Quantity A	***Quantity B***
Distance between points P & R.	20

101. The length of the rope A is between 1.2 to 3.2 and length of rope B is between 0.8 to 2.8

Quantity A	***Quantity B***
Length of rope A	Length of rope B



102. n, $2n-1$ and $2n+1$ are the lengths of the three sides of the triangle shown in the above figure. What is the length of the hypotenuse?

(A) 8
(B) 17
(C) 19
(D) 21
(E) 23

103. In how many maximum parts can a circular region be divided by using 3 lines which cut the circle at exactly 2 places?

(A) 5
(B) 7
(C) 9
(D) 11
(E) 13

104. Square $PQRS$ is tilted 90° anticlockwise around the point P, so that points Q, R and S reach to the points Q', R' & S', respectively. What is the distance covered by the point R if the length of PQ is 2?

(A) $\frac{\pi\sqrt{2}}{3}$
(B) $\frac{\pi\sqrt{2}}{2}$
(C) $\pi\sqrt{2}$
(D) $\pi\sqrt{3}$
(E) $2\pi\sqrt{3}$

105.

Quantity A	***Quantity B***
Area of a rectangle whose perimeter is 20	Area of a rectangle whose perimeter is 24

106. The volume of a right circular cylinder is 2000π. Height of the cylinder is 16 times the radius of its base.

Quantity A	***Quantity B***
Radius of the cylinder	1

107. The above figure shows a 12-sided regular polygon. What is the value of each individual internal angle of the given polygon?

(A) 120°
(B) 150°
(C) 160°
(D) 170°
(E) 180°

108. A cube having a volume of a^3 is cut along the diagonal of one of its face to cut it into two equal parts. What is the total surface area of either of the two equal parts?

(A) $\sqrt{2}a^2$
(B) $3a^2$
(C) $(2+\sqrt{2})a^2$
(D) $(3+\sqrt{2})a^2$
(E) $(5+\sqrt{2})a^2$

109. E and F are the midponits of sides CD and AD of square ABCD. What is the ratio of area of the triangle BEA and to that of the square ABCD?

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

110. A circular carpet is to be put on the rectangular floor of a living room having the dimension of 12 feet x 14 feet. What is the greatest diameter of the carpet that can be put on the floor, so that it is atleast 1 feet away from all the walls?

(A) 6
(B) 8
(C) 9
(D) 10
(E) 11

111. A stone is dropped in a pond which causes circular ripples. The radius of the ripple increases by x inches every second. If after 10 seconds the area enclosed by the circular ripple is 400π square inches. What is the value of x?

(A) 2
(B) 4
(C) $\sqrt{200}$
(D) $\sqrt{300}$
(E) $\sqrt{400}$

112. Given a circle has center at origin and radius 1. The points X, Y, and Z lie on the circle such that the length of arc XYZ is $\frac{2}{3}\pi$. What is the length of line segment XZ?

(A) $\sqrt{2}$
(B) $\sqrt{3}$
(C) 2
(D) $2+\sqrt{3}$
(E) $2+\sqrt{2}$

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For Questions 113 - 122, select all the answer choices that apply.

113. In a right angled triangle, the angle opposite one of the legs is 60 deg. Which of the following will be independently sufficient to find the area of the triangle?

(A) perimeter of the triangle
(B) length of the hypotenuse
(C) the ratio of the sides opposite angles 30^0 and 60^0 is 1: $\sqrt{3}$

114. The perimeter of a triangle ABC is 25 units. Which of the following options cannot be the length of one of the sides in the triangle?

(A) AB = 10 units
(B) AC = 13 units
(C) BC = 12 units
(D) AB = 18 units

115. A square countertop has a square tile inlay in the center, leaving an untiled strip of uniform width around the tile. If the ratio of the tiled area to the untiled area is 25 to 39, which of the following could be the width of the strip in inches?

(A) 1.5
(B) 3
(C) 4.5

116. Three straight lines, K, L and M can either touch or pass through a circle. Then into how many regions the circle can be divided by the three straight lines?

(A) 1
(B) 0
(C) 3
(D) 4
(E) 5
(F) 6

117. In triangle ABC, sides AB and AC are of lengths 10 and 12 units. Which of the following options can be probable values for area of triangle ABC?

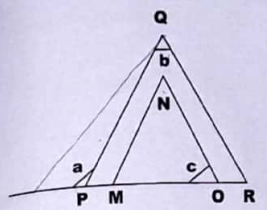
(A) 120
(B) 110
(C) 130
(D) None of the options above.

118. In a triangle ABC, in how many of the following options an angle must be at least 90^0?

(A) the angle included between sides whose lengths are 3 and 4
(B) the triangle ABC, in which the sides are of lengths 6, 8 and 11
(C) triangle ABC, in which the sides are of lengths 7, 24 and 21.
(D) isosceles triangle ABC in which two same sides are 10 cms each

119. The sides in a parallelogram $ABCD$ are 15 and 10. Which of the following statements would hold true?

(A) The integral value of the length of the diagonal AC is at least 19 if it is the longer diagonal in the parallelogram.
(B) The integral value of the length of the diagonal BD is at most 18, if it is the shorter diagonal in the parallelogram.
(C) The integral value of the area of the parallelogram cannot exceed 150 sq. units.
(D) None of the options above.



120. Which of the following options are true from the figure above?

(A) $\angle a = \angle b + \angle c$, if line QR is parallel to line NO.
(B) $\angle a + \angle MNO = 180^0$ if line PQ is parallel to line MN (C)
(C) $\angle MNO = \angle b$, if the above two options A and B are true besides being given that OMN is an equilateral triangle.

121. To find the number of diagonals a polygon will have, which of the following options is necessary?

(A) how many of the points joined to form the polygon are collinear.
(B) how many sides the polygon has.
(C) if the polygon is regular
(D) the sum of the interior angles if the polygon is regular.
(E) none of the options above.

122. The volume of a cuboid is 12 x 10 x 8, in correspondence with the formula l x b x h. A circular cylinder is exactly inserted into this cuboid. Which of the following options can be true?

(A) If the volume of the cylinder is 300π, then its length is 12
(B) If the volume of the cylinder is 80π, then its radius must be 10
(C) if the volume of the cylinder is 96π, then the area of its circular base must be 12π.
(D) None of the above.

123. The sides of a parallelogram are 10 and 11. The integral value of the length of the diagonal opposite the acute angle is at most

124. In a 30° - 60° - 90° right angled triangle, the side opposite angle 60° in the triangle is $3\sqrt{3}$. The perimeter of the triangle is

125. A cube has a volume of 64 units. The length of the longest stick that can be inserted inside the cube is

126. The length of a rectangle is 4 times the width. If the perimeter of the rectangle is 60, what is the width?

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127. In the equation $S = 3\pi r^2$, if the value of r is doubled, then the value of S is multiplied by

128. A triangle has two sides of lengths 4 cm and 6 cm. Its area is n square cm, where n is a prime number. The greatest possible value of n is

129. In a circular cylinder of volume $\pi r^2 h$, if the height is increased by 40% and the radius is decreased by 20%, the percentage decrease in the volume of the cylinder rounded off to the nearest tenth is

130. The perimeter of a semi circle is $4\pi + 8$. The area of a square which lies inside the semicircle, when rounded off to nearest integer, can be at most

131. In an isosceles triangle, the lengths of two sides are 3 and 7. The semi-perimeter of the triangle is

132. From a point P, a tangent PS of length 8 units is drawn to the circle with center at the origin O. If the point P is at a distance of 10 units from the origin, then the area of the circle is

PS = 10
OP = 8

— Parallelogram formula

— Two tangents to a circle from an point outside

MISCELLANEOUS

1.

Quantity A	Quantity B
$\frac{0.9999}{1.0002}$	$\frac{0.9998}{1.0001}$

2.

Quantity A	Quantity B
$\frac{0.01}{1 - 0.01}$	$\frac{0.01}{1 - 0.1}$

3. At a garage sale, prices for all the items sold were different. If the price of a radio sold at the garage sale was both the 15th highest price and the 20th lowest price amongst the prices of all the items that were sold, how many items were sold at the garage sale?

(A) 33
(B) 34
(C) 35
(D) 36
(E) 37

4. $2^{-x} < x < 2^{-5}$

Quantity A	Quantity B
$4x$	$\frac{1}{12}$

5. $y = 2x+20$, where y is an integer and $0 < x < 19$.

Quantity A	Quantity B
The number of different possible values of y	18

6. $ab = (b+1)$ & $a(b + c) = ab + c$

Quantity A	Quantity B
c	$\frac{a}{b+1}$

7. $S = \{2, 4, 6\}$
$T = \{2, 4, 6, 8, 10, 12\}$

A new set M is to be constructed such that, set S is a subset of M and set M is a subset of T. How many sets satisfying this property can be constructed?

(A) 5
(B) 6
(C) 7
(D) 8
(E) 9

8. Each of the sets $F_0, F_1, F_2, F_3, \ldots\ldots\ldots F_9$ satisfy the condition that each of them contain all the integers that are ending with the digit of their set number. For example F_1 has integers 5, 15, 25, 35, ... etc. The cubes of all the numbers of set F_7 are present in which of the following set?

(A) None
(B) F_2
(C) F_3
(D) F_7
(E) F_9

9. If $-8 \le x \le 10$ & $x + y = -4$, what is the least possible value of xy?

(A) 0
(B) –32
(C) –112
(D) –140
(E) –180

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10. Company Z has 54 employees. If the number of employees having birthdays on Wednesday is more than the number of employees having birthdays on any other day of the week, each of which have same number of birth-days, what is the minimum number of employees having birthdays on Wednesday.

(A) 6
(B) 7
(C) 8
(D) 9
(E) 12

11. An auditorium contains n seats arranged in 6 rows, each containing equal number of seats. The last row seats are pulled out and are divided equally among the remaining 5 rows such that each row appears identical after this whole transaction and no seat is left out. What is the minimum value of n?

(A) 24
(B) 30
(C) 48
(D) 60
(E) 90

12. If $(x + 1)(x - 2)(x + 3) = x^3 + ax^2 + bx + c$ for all values of x, where a, b, c are all integers. What is the value of c?

(A) -6
(B) -3
(C) -1
(D) 0
(E) 6

13. The number of passengers on a certain bus in Houston at any given time is given by the equation $P = -2(S-4)^2 + 32$, where P is the number of passengers and S is the number of stops that the bus has made since the beginning of its route. If the bus begins its route without any passenger, how many passengers will be on the bus two stops after the stop where it has its greatest number of passengers?

(A) 32
(B) 30
(C) 24
(D) 14
(E) 0

14. Amy's grade was the 90th percentile of the 80 grades for her class. Of the 100 grades from another class, 19 were higher than Amy's grade and the rest were lower. If no other grade was the same as Amy's grade, then Amy's grade was what percentile of the grades of two classes combined.

(A) 72nd
(B) 80th
(C) 81st
(D) 85th
(E) 92nd

15. In a class of 500 students, the grades were given as percentile. Fred's grade was 20th percentile, George's grade was 40th percentile and Harry's grade was 60th percentile.

Quantity A	Quantity B
Number of grades between Fred's grade and George's grade.	Number of grades between George's grade and Harry's grade

16. $X = \{1, 2, 3, 4, 5\}$
$Y = \{11, 12, 13, 14, 15\}$

If one number is selected at random from set X and another number is selected from set Y, how many different sums will be obtained?

(A) 5
(B) 9
(C) 18
(D) 20
(E) 25

17. $y = 2x + 9$ & $x^2 = 4$.

Quantity A	Quantity B
x	y

18.

Quantity A	Quantity B
$\frac{\frac{1}{9}}{100}$	$\frac{1}{1000} + \frac{\frac{1}{9}}{1000}$

19. There is a total of N twins in a hospital of which b is the number of boy twins and g is the number of girl twins.

Quantity A	Quantity B
The total number of boys	$N - b + g$

20. Andy has 6 Canadian dollars and y Australian dollars. If more than $\frac{3}{8}$ of the total dollars are Australian, then what is the minimum number of dollars that Andy has?

(A) 8
(B) 9
(C) 10
(D) 11
(E) 12

21. Jeff's birthday falls on 25th of June. In which month does birthday of Harry fall if he was born exactly 400 months after Jeff was born?

(A) June
(B) July
(C) August
(D) September
(E) October

22. There are 37 employees in company Y. If the number of employees of the company having birthdays in July is more than the number of employees having birthdays in any other month, then how many employees of the company Y have birthdays in July, so that atleast 3 employees have their birthdays in each month?

(A) 4
(B) 7
(C) 10
(D) 15
(E) 18

23. [z] represents the greatest integer value less than or equal to z.

Quantity A	Quantity B
$[x] + [y]$	$[x + y]$

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24. Three quarts of a solution A contains 5% of hydrogen peroxide. Solution B contains 20% of hydrogen peroxide. What volume of the solution B should be added to the 3 quarts of the solution A so that the resulting mixture contains 15% of hydrogen peroxide?

(A) 3 quarts
(B) 3.75 quarts
(C) 4.5 quarts
(D) 6 quarts
(E) 9 quarts

25. $S = \{1, 2, 3, 4, 6, 8\}$
$T = \{1, 2, 3, 6, 8\}$

If set X contains the elements which are products of the elements of the two sets S and T, how many distinct elements will the set X have?

(A) 8
(B) 10
(C) 15
(D) 18
(E) 30

26. $\frac{4}{7} = \frac{4+s}{7+t}$

Quantity A	Quantity B
s	$\frac{4t}{7}$

27. Tom has 'x' five cent coins, 'y' ten cent coins and 'z' 15 cent coins. If $x = y$ and $5x + 10y = 25z = 375$, how many five cent coins does Tom have?

(A) 10
(B) 15
(C) 20
(D) 25
(E) 30

28. The approximate value of $61.16 \times \frac{98^2}{\sqrt{401}}$ is

(A) 5
(B) 4
(C) 3
(D) 2
(E) 1

29. Among a group of horses, a few are seven years old while the remaining are eleven years old. The sum of the ages of all the horses is 83 years.

Quantity A	Quantity B
Number of horses that are 7yrs old.	Number of horses that are 11yrs old.

30. There are 33 balls and 7 boxes. Balls are filled in these boxes such that no box is left empty and each ball goes into a box. Which of the following must be true?

I. There are at least 5 balls in at least 1 box.
II. There are at least 4 balls in every box.
III. There are at least 2 boxes with the same number of balls.

(A) Only I
(B) Only II
(C) Only III
(D) Both I and II
(E) None of these

31. A company manufactures 10,000 bulbs at a cost of $0.6 each. Out of these bulbs, 0.1% were discarded and each of the remaining bulbs was sold at $1.1. What is the difference between the revenue and the manufacturing cost for the company?

(A) 4889
(B) 4989
(C) 4999
(D) 5189
(E) 5299

32. The tax that the company Z has to pay to the government for a particular month is $6,000 plus 6% of the profit above $250,000. What is the total amount of the profit in dollars that the company makes, if it pays a tax equivalent to 3% of its profit?

(A) 240,000
(B) 280,000
(C) 300,000
(D) 320,000
(E) 360,000

33. $(n - 2)(n - 3) = 0$

Quantity A	Quantity B
$-2n - 1$	$2n+1$

34. In a distribution of 8500 parameters, 26.7 has 56th percentile & 37.1 has 78th percentile. If A is the set of parameters having values between 26.7 & 37.1, what is the number of terms in set A?

(A) 1869
(B) 2475
(C) 3657
(D) 4741
(E) 6629

35. $\frac{1}{x} + \frac{1}{y} = 3$

Quantity A	Quantity B
$3xy$	$x + y$

36. Set M contains numbers that satisfy the condition that, if integer x is in the set then $x+3$ will also be in the set M. If -4 is one value in the set, which of the following values must also be present in the set M?

I. -7
II. -1
III 2

(A) I only
(B) II only
(C) I and II only
(D) II and III only
(E) I, II, and III

37. As a summer school assignment history teacher asked Four of her students (Tom, John, Harry and David) to collect antique coins. The number of coins they collected were in the ratio 2 to 3 to 5 to 4, respectively. If one of them collected 60 coins which of the following CANNOT be the total number of coins collected by all the four students?

(A) 168
(B) 210
(C) 280
(D) 420
(E) 500

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38. A manufacturing company employs staff who work either on full time basis or on part time basis. The ratio of number of males who work on part time basis to the number of males who work on full time basis is 4 to 5. And the ratio of number of females who work on part time basis to the number of males who work on part time basis is 3 to 2. If the ratio of the number of females who work on full time basis to the number of males who work on full time basis is 3:1, what is the ratio of number of females who work on part time basis to the number of females who work on full time basis?

(A) 3 to 2
(B) 3 to 5
(C) 4 to 5
(D) 2 to 5
(E) 6 to 5

39. If A, B are non-zero integers and $A^4B^4 - A^4B^2 = 12$, which of the following could be A^2 in terms of B?

I. $\frac{2}{B}$
II. $-\frac{2}{B}$
III. $\frac{3}{B}$

(A) I only
(B) II only
(C) I and II
(D) I and III
(E) I, II, and III

40. Raphael sells 1000 articles without any profit or loss. If he sells rest of the articles each at an extra cost of \$0.5, he gets a total profit of \$$P$. How many such articles did he sell, if price of each article was same?

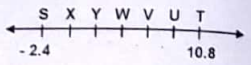
(A) $P + 500$
(B) $2P + 1000$
(C) $5P + 1000$
(D) 2000
(E) 5000

41. If the roots of the equation $2y^2+5y = 3$ are -3 and $\frac{1}{2}$, which of the following can be a root of the equation $2(y-2)^2+5(y-2) = 3$?

(A) $-\frac{5}{2}$
(B) -2
(C) -1
(D) 0
(E) 3/2

42. $\frac{0.3985}{157.535} =$

(A) 0.0025
(B) 0.0031
(C) 0.0044
(D) 0.005
(E) 0.0075



43. In the above figure, points S, X, Y, W, V, U and T are equally spaced on the number line as shown. Coordinates of points S and T are -2.4 and 10.8 respectively.

Quantity A	Quantity B
Coordinate of point V	6.4

44. A company has X employees including few men and few women. The number of men employees is Y and Z% of the total employees are advocates. If P% of women advocates is equal to 40, what is the number of men advocates?

(A) $\frac{ZY}{100} - \frac{4000}{P}$
(B) $\frac{ZY}{100} - 4000$
(C) $\frac{Z}{100} - \frac{4000}{P}$
(D) $\frac{X}{100} - \frac{4000}{P}$
(E) $ZX - \frac{4000}{P}$

45. Alfred saves X dollars more than Barry. If together they saved Y dollars, then how many dollars did Alfred save in terms of X and Y?

(A) $\frac{X-Y}{2}$
(B) $\frac{X}{2}$
(C) $\frac{Y}{2}$
(D) $\frac{X+Y}{2}$
(E) $X + \frac{Y}{2}$

46. If $xy = 20$, where x, y are positive integers, what is the number of different possible values of $(x + y)$?

(A) 2
(B) 3
(C) 4
(D) 5
(E) 6

47. $\frac{x-\frac{1}{x}}{1+x} = 99$. What is the value of $\frac{x-\frac{1}{x}}{1-x}$?

(A) –97
(B) –90
(C) 0
(D) 90
(E) 97

48.

Quantity A	Quantity B
$(\sqrt{2})(\sqrt{6})(\sqrt{7})$	9

49. Balls are distributed one at a time, into six baskets numbered 1 to 6. The 1st ball goes into the basket numbered one, 2nd ball goes into the basket numbered two and so on. If this is repeated for all the other balls then the 74th ball will go into which basket?

(A) 5
(B) 4
(C) 3
(D) 2
(E) 1

50. A lift has a maximum capacity of 20 bundles each having a weight of x lb or 30 bundles each having weight of y lb. If a person puts 12 bundles each of weight y lb, then maximum of how many more bundles of weight x lb can be put inside the lift?

(A) 4
(B) 8
(C) 10
(D) 12
(E) 18

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For Questions 51 - 59, select all the answer choices that apply.

51. According to Bushwell Town's building rules, a building must have a lift if it has at least 4 floors. Which of the following options will be true for buildings in Bushwell town?

(A) Mike can use a lift in Topaz towers, as it has 12 floors.

(B) Milton towers that has only 3 floors cannot provide a lift.

(C) Bill, a builder, can provide a lift for his office having only 2 floors.

(D) None of the above options.

52. The gravitational force of attraction between two objects of masses M and N with distance d between them is given by $F = (M \times N)/d^2$. Which of the following options are true?

(A) The force doubles if the distance between the two bodies doubles

(B) The force quadruples if each of the masses of the two bodies with the same distance between them double

(C) the force quadruples if the distance between the two bodies of the same masses reduces by half

(D) the force remains constant if the values of masses of each of the two bodies doubles and the distance between them reduces by half

53. At 10 am, Hamilton sets for aerobics class to reach at 11 am. Again at 12pm, he sets for tennis club. From the tennis club, he comes back home. Which of the following information will be required to find the distance between his home and tennis club?

(A) the speed at which he bicycles the distances between his home and aerobics and between aerobics and the tennis club.

(B) the sequence in location of the three points his home, the class and the club.

(C) None of the options above.

54. At an annual meeting of eight friends, each one shakes hand with the other, exchanges cards with the other and mobile numbers. Which of the following must be true?

Note : Every person exchanges only one card with the other and shares only one mobile number with the other and only once

(A) 28 handshakes will be made

(B) 56 times mobile numbers will be exchanged

(C) 56 handshakes will be made

(D) 56 cards will be exchanged

55. In a queue at a Mall, Pat is standing two persons behind Mike who is standing 5th from the counter. Indicate which of the following options are true, if there are 12 persons standing in the line in all?

(A) Pat is standing seven persons behind from the counter.

(B) Pat is standing five persons ahead from the end.

(C) Pat is standing ahead of four persons from the end.

(D) Mike is standing 10 persons ahead from the end.

56. Let $[p] = K$, where K is the greatest integer less than or equal to p.

Let $A = [x + y]$ and $B = [x] + [y]$.

Then which of the following options are true?

(A) A and B are equal if x and y are integers

(B) The value of B is at most the value of A if x and y are any real values.

(C) A and B are equal for any real value of x and y

57. $y = \frac{p}{q}$ and $x = \frac{p}{p+q}$. Which of the following options are true?

(A) $x = \frac{y}{y+1}$

(B) $x = \frac{y}{y-1}$

(C) $y = \frac{x}{x-1}$

(D) $y = \frac{x}{1-x}$

58. Which of the following options represents 20^{th} % of 20?

(A) 4

(B) 1

(C) 1/100

(D) 0.1

(E) 0.01

$\frac{1}{20 \times 100} \times 20 = \frac{1}{100}$

59. On the number line, x is a number between k and m, such that x is twice as far from k as from m, then which of the following options are true ($k < m$)?

(A) $x = (2k + m)/3$

(B) $x = (2m + k)/3$

(C) $x = (m + k)/2$

(D) $m = (3x - k)/2$

(E) $k = 3m - 2x$

60. P finished half of a work, Q finished $\frac{1}{3}^{rd}$ of the remaining, and R finished $\frac{1}{4}^{th}$ of the remaining work. The total amount of work still left unfinished is

61. It took 12 men, 5 hours to build an airstrip. Working at the same rate, the number of additional men that could have been hired in order for the job to have taken 1 hour less is

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62. If the number 0.46256 is rounded off to the hundredth digit, then the number would be

63. $225 \times 81 = 3^q \times 5^p$, then $q - p =$

64. $g(x)$ is a constant function of x, such that $g(7.7) = 7$. Then the value of $g(77) - 77 =$

65. For the function $f(x) = \frac{2x+3}{(x-2)(x-3)}$ to be well-defined, x must not be equal to the values:

66. In a sequence of terms, if n^{th} term: $S_n = S_{n-1} + 2$ and $S_2 = 2$. Then, the average of all the terms from S_1 to S_{15}, inclusive is

67. The remainder when $76^4 + 76^3 - 76^2 - 76$ is divided by 75 is

68. If 15% of 300 is $2m$, then what is the value of $2m$ % of 500 is

69. If $\frac{a}{b} = \frac{c}{d} = \frac{3}{5}$, then $\frac{a+c}{b+d}$ is

70. For every two steps that Jim walks up the stairs in one second, Joe comes down by 3 steps in the same time. If the two persons start at the same time at 9 am and if there are 50 steps in all, then the time they will take to meet each other is

71. Two cars start toward each other at the same time. One car travels at 40mph and the other car travels at 50mph. If the distance between the two cars is 180 miles, then the distance from the first car where they will meet each other is

72. Two cars start at the same time around a circular path of area 100π sq. miles. One car travels at 20π mph and the other car takes 16π mph to complete one round of the circular path. If they start at 1 pm today, at what time again will they meet each other first time?

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ANSWER KEY

GENERAL ARITHMETIC

A. Sequences and Series

1.	D
2.	B
3.	D
4.	B
5.	B
6.	B
7.	D
8.	B
9.	C
10.	C
11.	D
12.	B
13.	C
14.	C
15.	C
16.	E
17	A, B, C

B. Exponents

1.	A
2.	B
3.	A
4.	D
5.	D
6.	A
7.	D
8.	D
9.	B
10.	D
11.	B
12.	D
13.	B
14.	B
15.	C
16.	C
17.	D
18.	C
19.	D
20.	C
21.	D
22.	D
23.	A
24.	D
25.	B
26.	D
27.	C
28.	C
29.	B
30.	D
31.	D
32.	A
33.	B
34.	B
35.	D
36.	A, D
37.	B, C
38.	B, C, D
39.	A, D
40.	A
41.	B, C, D
42.	B, C
43.	16
44.	64
45.	4

ANSWER KEY

GENERAL ARITHMETIC

C. Percentages

1.	A
2.	C
3.	B
4.	E
5.	D
6.	B
7.	B
8.	B
9.	A
10.	C
11.	B
12.	C
13.	A
14.	C
15.	D
16.	A
17.	A
18.	D
19.	C
20.	C
21.	B
22.	D
23.	A
24.	D
25.	D
26.	D
27.	E
28.	B
29.	C, D, E
30.	
31.	C, D
32.	B, D
33.	B, C, D
34.	A, C
35.	C, E
36.	1900/81
37.	17
38.	50

D. Compound Interest and Simple Interest

1.	B
2.	B
3.	C
4.	C
5.	A
6.	B
7.	B
8.	C
9	A, B

E. Venn Diagrams

1.	E
2.	C
3.	D
4.	B
5.	A
6.	B
7.	C
8.	B
9.	B
10.	C
11	B, C

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ANSWER KEY

NUMBER SYSTEM

1.	C	24.	A	47.	D	70.	B, C, D, E, F
2.	C	25.	C	48.	D	71.	A, B, C, D
3.	C	26.	C	49.	B	72.	B, D, E
4.	A	27.	A	50.	D	73.	A, C
5.	A	28.	D	51.	E	74.	E
6.	A	29.	B	52.	A	75.	A, B, C, D
7.	B	30.	D	53.	D	76.	B, C
8	D	31.	C	54.	D	77	B
9.	C	32.	C	55.	E	78	A, C
10.	A	33.	D	56.	C	79	B, D, E
11.	C	34.	C	57.	B	80	A, B, C
12.	E	35.	C	58.	D	81	A, C, E
13.	C	36.	C	59.	E	82	A, B
14.	D	37.	D	60.	A, B	83	B, D
15.	C	38.	A	61.	A, C, D, F, H	84	A, D
16.	D	39.	D	62.	B, E, G, J	85	196
17.	A	40	D	63.	A, B	86	6
18.	B	41.	D	64.	A, D	87	9
19.	A	42.	B	65.	A, B	88	2
20.	C	43.	C	66.	B, E	89	10
21.	B	44.	C	67.	A, B, C	90	86
22.	D	45.	E	68.		91	5
23.	B	46.	D	69.	A, C, D	92	$\frac{5}{8}$

ANSWER KEY

STATISTICS

1.	A	23.	D	45.	D
2.	A	24.	B	46.	E
3.	B	25.	B	47.	D
4.	D	26.	B	48.	D
5.	A	27.	A	49.	B
6.	C	28.	C	50.	B
7.	C	29.	D	51.	C
8.	D	30.	C	52.	D
9.	D	31.	D	53.	B
10.	B	32.	A	54.	B, C
11.	D	33.	D	55.	A
12.	E	34.	A	56.	D, E
13.	D	35.	E	57.	D, E
14.	D	36.	B	58.	C, D
15.	A	37.	A	59.	A, B
16.	C	38.	B	60.	A
17.	D	39.	A	61.	B, D
18.	D	40.	B	62.	A, B
19.	B	41.	B	63.	10
20.	B	42.		64.	0
21.	E	43.	A	65.	0
22.	D	44.	B	66.	15

PERMUTATIONS AND COMBINATIONS

1.	D
2.	B
3.	C
4.	C
5.	B
6.	D
7.	E
8.	D
9.	B
10.	B
11.	E
12.	B
13.	A
14.	C
15.	B
16.	B
17.	B
18.	B
19.	C
20.	D
21.	1260

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ANSWER KEY

PROBABILITY

1.	D	15.	C
2.	D	16.	B
3.	A	17.	B
4.	C	18.	A
5.	E	19.	E
6.	D	20.	D
7.	D	21.	D
8.	C	22.	D
9.	C	22.	D
10.	B	24.	D
11.	A	25.	B
12.	B	26.	B, D
13.	B	27.	0.58
14.	A		

INEQUALITIES AND MODULUS

1.	C	21.	A
2.	C	22.	D
3.	C	23.	A
4.	A	24.	A
5.	D	25.	B
6.	D	26.	A
7.	C	27.	D
8.	C	28.	D
9.	A	29.	C
10.	E	30.	B
11.	D	31.	D
12.	B	32.	A, B, C
13.	D	33.	B, D
14.	D	34.	A, C, D
15.	D	35.	A, C, D
16.	C	36.	A, B, D
17.	C	37.	B, C
18.	A	38.	A
19.	D	39.	B, C
20.	A		

ANSWER KEY

COORDINATE GEOMETRY AND FUNCTIONS

1.	A	24.	B
2.	C	25.	C
3.	B	26.	D
4.	C	27.	B
5.	E	28.	C
6.	C	29.	C
7.	C	30.	A
8.	D	31.	D
9.	C	32.	C
10.	D	33.	E
11.	D	34.	A
12.	B	35.	B, D
13.	D	36.	B, C
14.	A	37.	A, B, C
15.	C	38.	A, B, C
16.	B	39.	A, B, C, D
17.	B	40.	A, B
18.	C	41.	D
19.	E	42.	A, C, D
20.	B	43.	1
21.	D	44.	3
22.	C	45.	0
23.	B		

SPEED, TIME, DISTANCE AND WORK RATE

1.	C	13.	C
2.	C	14.	B
3.	B	15.	B
4.	D	16.	D
5.	C	17.	B
6.	B	18.	C
7.	B	19.	A
8.	C	20.	A
9.	A	21.	B
10.	E	22.	A
11.	A	23.	C
12.	C	24.	

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ANSWER KEY

GEOMETRY

1.	B	35.	D	69.	B	103.	B
2.	A	36.	E	70.	D	104.	C
3.	C	37.	B	71.	B	105.	D
4.	E	38.	B	72.	D	106.	A
5.	A	39.	B	73.	A	107.	B
6.	D	40.	C	74.	D	108.	D
7.	D	41.	D	75.	C	109.	C
8.	C	42.	D	76.	B	110.	D
9.	B	43.	D	77.	E	111.	A
10.	E	44.	D	78.	C	112.	B
11.	A	45.	B	79.	C	113.	A, B
12.	C	46.	E	80.	B	114.	B, D
13.	C	47.	B	81.	B	115.	A, B, C
14.	B	48.	D	82.	C	116.	B, C, D, E, F
15.	B	49.	C	83.	D	117.	D
16.	B	50.	A	84.	E	118.	B, C
17.	A	51.	C	85.	E	119.	A, B, C
18.	D	52.	B	86.	C	120.	A, B, C
19.	B	53.	B	87.	B	121.	B, D
20.	B	54.	C	88.	D	122.	D
21.	D	55.	D	89.	C	123.	14
22.	B	56.	C	90.	D	124.	$9+3\sqrt{3}$
23.	A	57.	D	91.	D	125.	$4\sqrt{3}$
24.	D	58.	B	92.	D	126.	6
25.	B	59.	A	93.	B	127.	4
26.	B	60.	C	94.	C	128.	11
27.	B	61.	C	95.	D	129.	10.4
28.	B	62.	B	96.	D	130.	13
29.	C	63.	D	97.	B	131.	8.5
30.	C	64.	D	98.	A	132.	36π
31.	A	65.	B	99.	D		
32.	D	66.	C	100.	D		
33.	E	67.	D	101.	D		
34.	D	68.	B	102.	B		

ANSWER KEY

MISCELLANEOUS

1.	A	26.	C	50.	D
2.	B	27.	D	51.	A, C
3.	B	28.	C	52.	B, C
4.	D	29.	B	53.	C
5.	A	30.	A	54.	A, D
6.	D	31.	B	55.	A, C
7.	D	32.	C	56.	A, B
8.	C	33.	B	57.	A, D
9.	D	34.	A	58.	C, E
10.	E	35.	C	59.	B, D
11.	B	36.	D	60.	$\frac{1}{4}$
12.	A	37.	E	61.	3
13.	C	38.	D	62.	0.46
14.	D	39.	C	63.	4
15.	C	40.	B	64.	–70
16.	B	41.	C	65.	2, 3
17.	B	42.	A	66.	34
18.	C	43.	C	67.	0
19.	D	44.	A	68.	225
20.	C	45.	D	69.	$\frac{3}{5}$
21.	E	46.	B	70.	10
22.	A	47.	E	71.	80 miles
23.	D	48.	A	72.	6:00 PM today
24.	D	49.	D		
25.	C				

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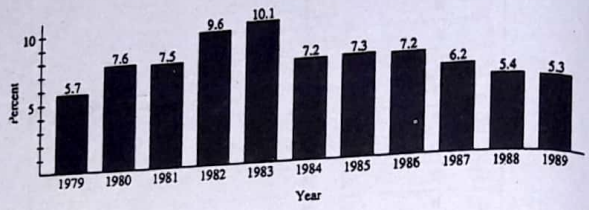
DATA INTERPRETATION PRACTICE SET 1

Questions 1-5 refer to the following graph and table.

UNITED STATES JUNE UNEMPLOYMENT RATES AS A PERCENT OF WORK FORCE
1979-1989



UNEMPLOYMENT DATA FOR THE ELEVEN STATES WITH THE LARGEST POPULATIONS IN 1989

State	Unemployment Rate May (as a percent of state work force)	Unemployment Rate June (as a percent of state work force)	Number of Unemployed June (in thousands)
California	5.5	5.6	797
New York	5.3	5.0	439
Texas	5.9	6.1	502
Illinois	5.7	5.5	325
Pennsylvania	4.6	4.0	239
Florida	6.4	6.1	384
Ohio	5.4	5.6	307
Michigan	6.7	7.3	339
New Jersey	3.0	4.2	165
North Carolina	3.7	3.6	124
Massachusetts	3.6	4.0	126

1. In June 1989, how many of the eleven states listed had an unemployment rate greater than that for the nation as a whole?
   (A) Three
   (B) Four
   (C) Five
   (D) Six
   (E) Seven

2. Of the following states, which had the greatest increase in the unemployment rate from May to June of 1989?
   (A) New York
   (B) Texas
   (C) Pennsylvania
   (D) Michigan
   (E) New Jersey

3. Of the following, which was the longest period of consecutive decreases in the United States June unemployment rates?
   (A) 1985 to 1989
   (B) 1984 to 1989
   (C) 1984to 1987
   (D) 1983 to 1989
   (E) 1983 to 1984

4. The change in the unemployment rate in the United States from June 1986 to June 1987 was how many times the change in the unemployment rate from June 1988 to June 1989?
   (A) 0.01
   (B) 0.1
   (C) 1.0
   (D) 10.0
   (E) 100.0

5. In June 1989, if a total of 6.5 million people were unemployed in the United States, then the number of people unemployed in Ohio was approximately what percent of the 6.5 million?
   (A) 5.5%
   (B) 4.7%
   (C) 3.7%
   (D) 0.5%
   (E) 0.4%

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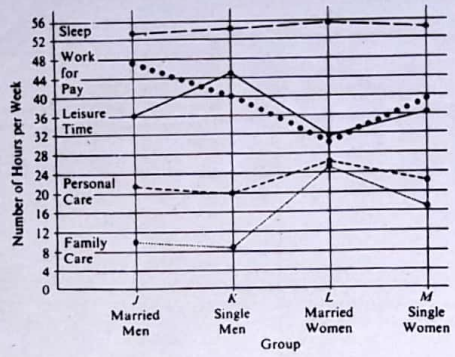
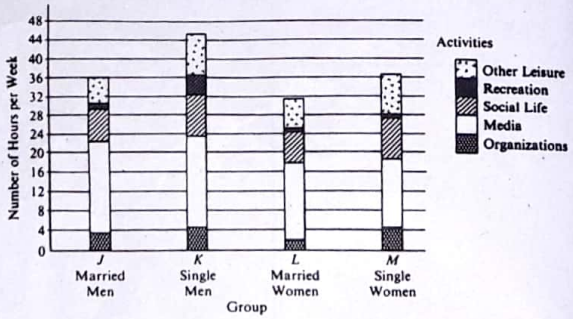
DATA INTERPRETATION PRACTICE SET 2

AVERAGE NUMBER OF HOURS PER WEEK SPENT IN MAJOR TYPES OF ACTIVITIES BY EMPLOYED PERSONS



AVERAGE NUMBER OF HOURS PER WEEK SPENT IN LEISURE-TIME ACTIVITIES BY EMPLOYED PERSONS



Note: Graphs drawn to scale.

1. In which major type of activity is the average number of hours spent per week most nearly the same for all four groups?

(A) Sleep
(B) Work for pay
(C) Leisure time
(D) Personal care
(E) Family care

2. Approximately what is the average number of hours per week that employed single women spend in leisure-time activities?

(A) 47
(B) 39
(C) 37
(D) 30
(E) 17

3. Approximately what is the average number of hours per week that employed married men spend on media activities?

(A) 12
(B) 16
(C) 19
(D) 22
(E) 25

4. Which of the following lists the four groups from least to greatest with respect to the average number of hours per week that each spends working for pay?

(A) *J, K, M, L*
(B) *J, L, M, K*
(C) *L, J, M, K*
(D) *L, K, M, J*
(E) *L, M, K, J*

5. Approximately what percent of the average number of hours per week spent in leisure-time activities by employed single men is spent on social-life activities?

(A) 5%
(B) 9%
(C) 15%
(D) 20%
(E) 27%

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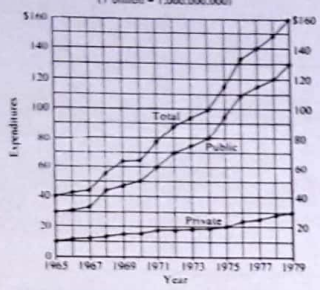
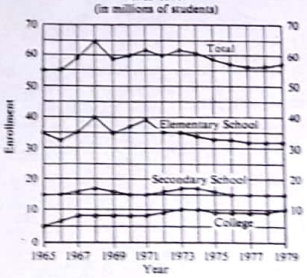
DATA INTERPRETATION PRACTICE SET 3

PUBLIC AND PRIVATE SCHOOL EXPENDITURES
1965-1979
(in billions of dollars)
(1 billion = 1,000,000,000)



SCHOOL ENROLLMENT BY LEVEL OF INSTRUCTION
1965-1979
(in millions of students)



1. Of the following years, which showed the least difference between public school expenditures and private school expenditures?
   (A) 1965
   (B) 1970
   (C) 1974
   (D) 1978
   (E) 1979

2. For each year from 1965 to 1979, the total enrollment in college, secondary school, and elementary school was in which of the following ranges?
   (A) 50 to 60 million
   (B) 55 to 60 million
   (C) 55 to 65 million
   (D) 60 to 65 million
   (E) 60 to 70 million

3. In 1970, approximately how many billion dollars were spent on public elementary schools?
   (A) 37
   (B) 50
   (C) 60
   (D) 87
   (E) It cannot be determined from the information given.

4. Which of the following periods showed a continual increase in the total school enrollment?
   (A) 1967-1969
   (B) 1969-1971
   (C) 1971-1973
   (D) 1973-1975
   (E) 1975-1977

5. In 1972, public school expenditures were approximately what percent of the total school expenditures for that year?
   (A) 20%
   (B) 60%
   (C) 70%
   (D) 80%
   (E) 90%

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DATA INTERPRETATION PRACTICE SET 4

UNITED STATES POPULATION
(official census 1890-1980)

Year	Population (in millions)	10-year Increase (in millions)	Year	Population (in millions)	10-year Increase (in millions)
1890	62.9		1940	131.7	8.9
1900	76.0	13.1	1950	150.7	19.0
1910	92.0	16.0	1960	179.3	28.6
1920	105.7	13.7	1970	203.2	23.9
1930	122.8	17.1	1980	223.9	20.7

1. By how many million did the United States population increase from 1920 to 1950?
   (A) 5.3
   (B) 19.0
   (C) 45.0
   (D) 74.7
   (E) 87.8

2. During which of the following 10-year intervals was the United States population increase the least in actual number?
   (A) 1890-1900
   (B) 1900-1910
   (C) 1920-1930
   (D) 1930-1940
   (E) 1940-1950

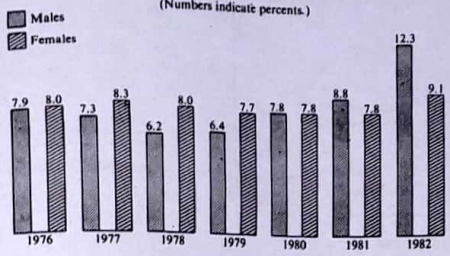
3. By approximately what percent did the population of the United States increase from 1900 to 1980?
   (A) 1.6%
   (B) 2.56%
   (C) 17%
   (D) 116%
   (E) 195%

4. In which of the following years will the United States population first reach 260 million?
   (A) 1990
   (B) 1995
   (C) 2000
   (D) 2005
   (E) It cannot be determined from the information given.

5. If the percent increase in population from 1910 to 1920 had been approximately the same as the percent increase from 1900 to 1910, the 10-year increase, in millions, from 1910 to 1920, would have been approximately
   (A) 3
   (B) 6
   (C) 16
   (D) 19
   (E) 29

DATA INTERPRETATION PRACTICE SET 5

STATE Z UNEMPLOYMENT RATES*
(Numbers indicate percents.)



*Rates are based on male and female labor forces, respectively.

1. For how many of the years shown was the unemployment rate for females less than the unemployment rate for males?
   (A) One (B) Two (C) Three
   (D) Four (E) Five

2. For how many of the years from 1977 through 1982, inclusive, did the unemployment rate for males increase over the rate for males the previous year?
   (A) One (B) Two (C) Three
   (D) Four (E) Five

3. What was the unemployment rate (including both males and females) in State Z during 1977?
   (A) 7.8%
   (B) 8.3%
   (C) 15.6%
   (D) 16.6%
   (E) It cannot be determined from the information given.

4. In State Z in 1982. the total labor force was 1 million, of which 55 percent were males. If the unemployment rate for males is defined as the ratio of the number of unemployed males to the number of males in the labor force, what was the approximate number of unemployed males in State Z in 1982?
   (A) 70,000 (B) 55,000
   (C) 50,000 (D) 40,000
   (E) 15,000

5. Which of the following statements about unemployment in State Z can, be inferred from the graph?
   I. The same number of females was unemployed in 1981 as in 1980.
   II. The unemployment rate for males in 1982 was more than I times the rate for males in 1976.
   III. From 1978 to 1979, the number of unemployed males increased,
   (A) None (B) I only (C) II only
   (D) III only (E) I, II, and III

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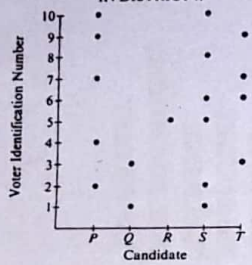
DATA INTERPRETATION PRACTICE SET 6

RESULTS OF A SAMPLE OF VOTERS IN DISTRICT *X*



The graph above shows how a sample of 10 different voters (vertical axis) voted for 5 different candidates (horizontal axis). Each voter voted for either one or two of the five candidates. (No voter voted twice for the same candidate.) The two candidates receiving the most votes were the winners. The sample constituted 5 percent of those in the district who voted, and the number of votes in the district for each candidate was in the same proportion as the number of votes in the sample for each candidate.

1. How many people in the sample voted for both winners?
   (A) One
   (B) Two
   (C) Three
   (D) Five
   (E) Six

2. What fraction of the total number of votes cast did the two winners receive?
   (A) $\frac{11}{18}$ (B) $\frac{11}{20}$ (C) $\frac{1}{2}$
   (D) $\frac{1}{3}$ (E) $\frac{3}{10}$

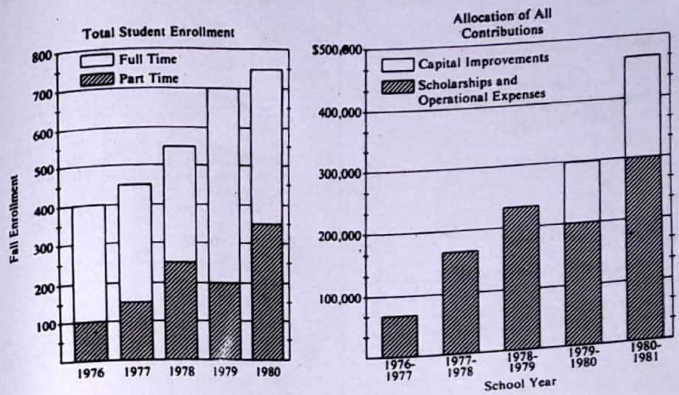
3. What percent of the sample voted for at least one of the two winners?
   (A) 11%
   (B) 20%
   (C) 55%
   (D) 61%
   (E) 90%

4. How many votes were cast in district *X*?
   (A) 18
   (B) 90
   (C) 200
   (D) 360
   (E) 400

5. In district *X*, candidate *T* received how many more votes than candidate Q?
   (A) 2
   (B) 10
   (C) 20
   (D) 40
   (E) 80

DATA INTERPRETATION PRACTICE SET 7

COLLEGE *R*: ENROLLMENT AND CONTRIBUTIONS 1976-1980



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1. What was the total number of students enrolled at College *R* in the fall of 1979?

(A) 200
(B) 250
(C) 500
(D) 650
(E) 700

2. By what percent did the number of part-time students enrolled increase from the fall of 1979 to the fall of 1980?

(A) 7%
(B) 42%
(C) 66
(D) 75%
(E) 80%

3. What was the increase, if any, in the number of full-time students enrolled at College *R* from the fall of 1976 to the fall of 1977?

(A) 0
(B) 50
(C) 100
(D) 150
(E) 200

4. In the 1978-1979 school year, 12 percent of the amount of contributions allocated to scholar ships and operational expenses was allocated to heating costs, approximately how much was NOT allocated to heating costs?

(A) $2,000
(B) $25,000
(C) $176,000
(D) $205,000
(E) $250,000

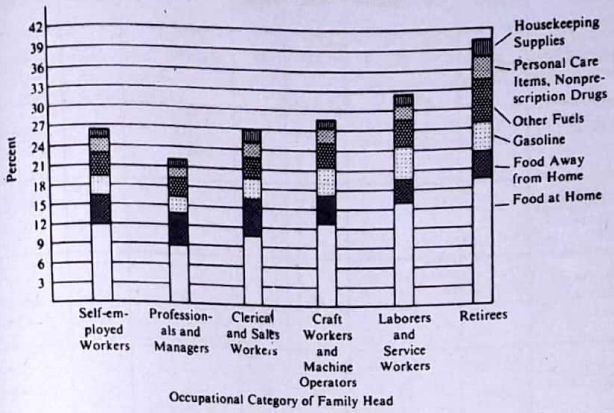
5. Approximately what was the total amount of contributions to College *R* from the 1978-1979 school year through the 1980-1981 school year, inclusive?

(A) $967,000
(B) $1,000,000
(C) $9,000,000
(D) $9,667,000
(E) $10,000,000

DATA INTERPRETATION PRACTICE SET 8

EXPENDITURES ON FOOD AND SELECTED NONFOOD ITEMS, 1973

Percent of Average Annual Income (before taxes) Spent by Families on Food and Selected Nonfood Items



Note: Drawn to scale.

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Average Weekly Food and Household Expenditure

Occupational Category of Family Head	Percent of Food and Household Expenditures						Average Weekly Food and Household Expenditures
	Food at Home			Food Away from Home	Personal Care Items, Nonprescription Drugs	House-keeping Supplies	
	Meats, Poultry, Seafood	Cereals, Bakery and Dairy Products, Fruits and Vegetables	Other Food at Home				
Self-employed Workers	22	25	14	22	10	7	$35.88
Professionals and Managers	19	23	11	29	11	7	$38.77
Clerical and Sales Workers	21	22	11	28	11	7	$32.07
Craft Workers and Machine Operators	23	25	15	21	9	7	$35.44
Laborers and Service Workers	24	27	14	19	9	7	$28.86
Retirees	23	29	14	16	11	7	$19.83

1. For which of the following categories was the percent of the average annual income (before taxes) spent on food at home the least?

(A) Self-employed workers
(B) Professionals and managers
(C) Clerical and sales workers
(D) Craft workers and machine operators
(E) Laborers and service workers

2. Approximately what average amount per week did the families of professionals and managers spend on food away from home?

(A) $2
(B) $8
(C) $11
(D) $29
(E) $38

3. Approximately what percent of the average weekly food and household expenditures of clerical and sales workers was spent on fruits and vegetables?

(A) 4%
(B) 7%
(C) 22%
(D) 25%
(E) It cannot be determined from the information given.

4. Approximately what percent of the total average annual income (before taxes) of retirees was spent on meats, poultry, and seafood (consumed at home)?

(A) 7%
(B) 10%
(C) 20%
(D) 23%
(E) 31%

5. Which of the following statements can be inferred from the information given?

I. Of the categories shown, retirees had the greatest average annual incomes (before taxes).

II. For all the categories shown, the average amount spent per week on housekeeping supplies was the same.

III. Of the categories shown, the average amount spent per week on meats, poultry, and seafood (consumed at home) was greatest for craft workers and machine operators.

(A) I only
(B) II only
(C) III only
(D) I and II
(E) II and III

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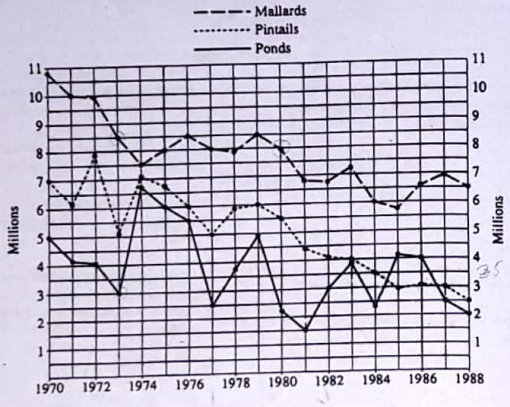
DATA INTERPRETATION PRACTICE SET 9

THE NUMBER OF PONDS AND THE POPULATIONS OF TWO SPECIES OF DUCKS (MALLARDS AND PINTAILS) IN A REGION OF NORTH AMERICA: 1970 – 1988



Note: Drawn to scale.

1. By approximately how many million did the mallard population decrease from 1970 to 1988?
   (A) 0.6
   (B) 2.8
   (C) 3.6
   (D) 4.3
   (E) 7.0

2. In 1984 the population of pintails was approximately what fraction of the mallard population?
   (A) $\frac{5}{7}$
   (B) $\frac{7}{12}$
   (C) $\frac{1}{3}$
   (D) $\frac{1}{4}$
   (E) $\frac{3}{20}$

3. What was the approximate percent increase in the number of ponds from 1973 to 1974?
   (A) 80%
   (B) 125%
   (C) 175%
   (D) 200%
   (E) 375%

4. During which of the following periods was the percent decrease in the mallard population close to 25 percent?
   (A) 1970 to 1973
   (B) 1972 to 1973
   (C) 1974 to 1986
   (D) 1980 to 1984
   (E) 1984 to 1985

5. For any pair of successive years between 1977 and 1982, inclusive, the increase or decrease in the number of ponds was between
   (A) 0.7 and 2.8 million
   (B) 1.0 and 3.0 million
   (C) 1.5 and 5.3 million
   (D) 2.5 and 4.8 million
   (E) 4.1 and 5.3 million

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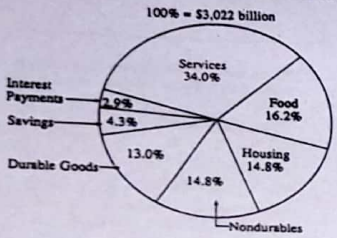
DATA INTERPRETATION PRACTICE SET 10

EXPENDITURE OF DISPOSABLE PERSONAL INCOME: 1986

100% = $3,022 billion



SAVINGS AS A PERCENT OF DISPOSABLE PERSONAL INCOME: 1955-1986

Note: Graphs drawn to scale.

1. In 1986 approximately how many billion dollars were spent on durable goods?
   (A) 91
   (B) 393
   (C) 453
   (D) 504
   (E) 1,007

2. In 1986 housing and nondurables together accounted for approximately what fraction of disposable personal income?
   (D)
   (E)

3. Savings as a percent of disposable personal income was approximately how many times as great in 1975 as in 1955?
   (A) 0.6
   (B) 0.8
   (C) 1.3
   (D) 1.5
   (E) 1.7

4. If the gross national product in 1986 was $1,213 billion more than disposable personal income, then savings that year were approximately what percent of the gross national product?
   (A) 1.5%
   (B) 2%
   (C) 2.5%
   (D) 3%
   (E) 6%

5. Which of the following statements can be inferred from the graphs?
   I. In 1986 more than $1,000 billion of disposable personal income was spent for services.
   II. From 1955 to 1986, inclusive, savings as a percent of disposable personal income was never greater than 8.5 percent.
   III. The total dollar amount of savings was greater in 1975 than in 1980.
   (A) I only
   (B) II only
   (C) III only
   (D) I and III only
   (E) I, II, and III

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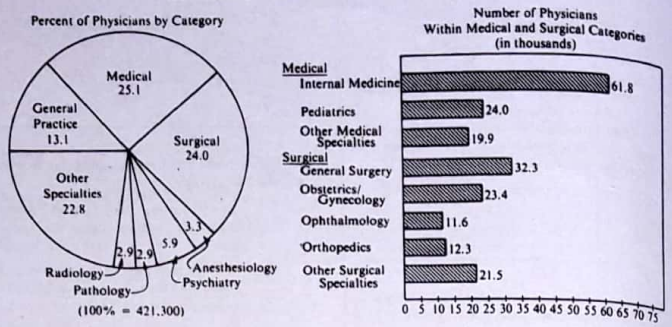
DATA INTERPRETATION PRACTICE SET 11

PHYSICIANS CLASSIFIED BY CATEGORY IN 1977



1. Approximately what was the ratio of physicians in the surgical category to physicians in pathology?
   (A) 10 to 1
   (B) 8 to 1
   (C) 7 to 1
   (D) 5 to 6
   (E) 4 to 5

2. Approximately how many more physicians were in psychiatry than in radiology?
   (A) 3,000
   (B) 6,300
   (C) 12,600
   (D) 24,800
   (E) 37,000

3. Approximately how many of the physicians in the medical category were not in pediatrics?
   (A) 61,800
   (B) 76,000
   (C) 81,700
   (D) 92,600
   (E) 101,100

4. If there was a total of 334,000 physicians in 1970, what was the approximate percent increase in the number of physicians from 1970 to 1977?
   (A) 10%
   (B) 12%
   (C) 16%
   (D) 20%
   (E) 26%

5. In 1977, if twice as many anesthesiologists as orthopedists were sued for malpractice and 10 percent of the orthopedists were sued, approximately what percent of the anesthesiologists were sued?
   (A) 5%
   (B) 9%
   (C) 18%
   (D) 22%
   (E) 25%

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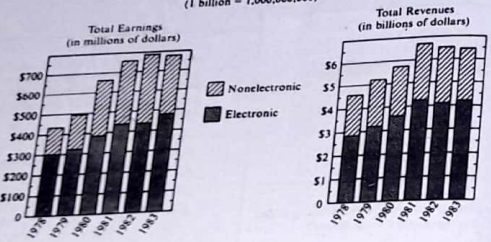
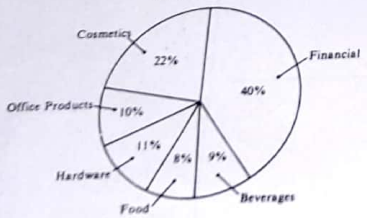
DATA INTERPRETATION PRACTICE SET 12

DISTRIBUTION OF EARNINGS AND REVENUES FOR COMPANY *X*, 1978-1983
ELECTRONIC AND NONELECTRONIC OPERATIONS

(1 billion = 1,000,000,000)



Distribution of Earnings from Nonelectronic Operations, 1983
(in millions of dollars)



Note: Drawn to scale.

1. Total earnings from operations in 1982 were approximately how much more than total earnings from operations in 1978?
   (A) $100 million
   (B) $125 million
   (C) $180 million
   (D) $340 million
   (E) $475 million

2. For the year in which earnings from electronic operations first exceeded $400 million, total revenues were approximately
   (A) $2.8 billion
   (B) $4.5 billion
   (C) $5.2 billion
   (D) $5.8 billion
   (E) $6.7 billion

3. In 1979, total earnings for Company *X* were approximately what percent of total revenues?
   (A) 1%
   (B) 5%
   (C) 10%
   (D) 15%
   (E) 60%

4. For the two years in which earnings from electronic operations were most nearly equal, the combined earnings from nonelectronic operations were most nearly
   (A) $340 million
   (B) $520 million
   (C) $670 million
   (D) $780 million
   (E) $1,520 million

5. In 1983 earnings from financial nonelectronic operations accounted for approximately how many millions of dollars?
   (A) 312
   (B) 300
   (C) 180
   (D) 140
   (E) 120

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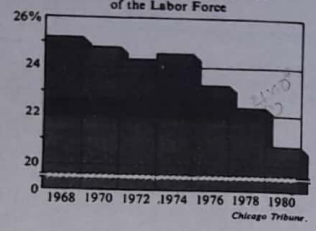
DATA INTERPRETATION PRACTICE SET 13

UNION MEMBERSHIP IN THE LABOR FORCE, 1968-1980

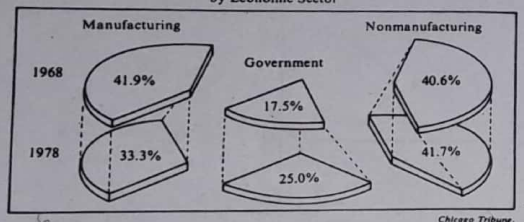
Labor Force

Year	Workers (in millions)
1968	75.9
1970	78.6
1972	81.7
1974	85.9
1976	87.5
1978	94.4
1980	96.5

Union Membership as a Percent of the Labor Force



Distribution of Union Membership by Economic Sector



Note: Drawn to scale.

1. Over which of the following two-year periods was there the greatest increase in the number of workers in the labor force?
   (A) 1968-1970
   (B) 1970-1972
   (C) 1972-1974
   (D) 1974-1976
   (E) 1976-1978

2. In 1974 approximately how many million workers were members of a labor union?
   (A) 17.2
   (B) 19.2
   (C) 21.1
   (D) 24.5
   (E) 85.9

3. From 1968 to 1980, the size of the labor force increased by approximately what percent?
   (A) 20%
   (B) 21%
   (C) 27%
   (D) 73%
   (E) 80%

4. In 1978 there were approximately 21 million union members. Approximately how many million more of these were in the manufacturing sector than in the government sector?
   (A) 8.6
   (B) 7.8
   (C) 6.9
   (D) 5.2
   (E) 1.7

5. In 1968 the number of union members in the non-manufacturing sector was approximately what percent of the total labor force?
   (A) 10%
   (B) 15%
   (C) 25%
   (D) 30%
   (E) 41%

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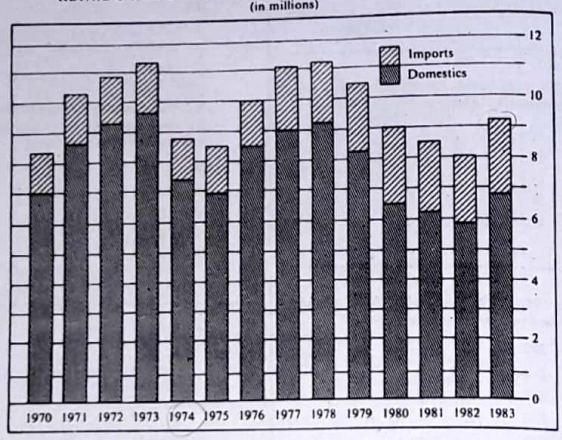
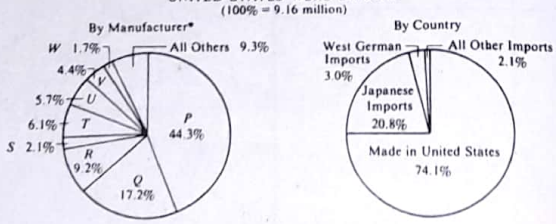
DATA INTERPRETATION PRACTICE SET 14

RETAIL SALES OF NEW CARS IN THE UNITED STATES, 1970-1983
(in millions)



HOW THE 1983 RETAIL SALES OF NEW CARS IN THE UNITED STATES WERE DIVIDED
(100% = 9.16 million)



*Domestic: *P*, *Q*, *R*, and *S*
Japanese: *T*, *U*, and *V*
West German: *W*

Note: Drawn to scale.

1. What was the last year prior to 1983 in which retail sales of new cars in the United States exceeded the retail sales of new cars in 1983?

(A) 1979
(B) 1978
(C) 1977
(D) 1976
(E) 1973

2. For the year shown in which the total number of new cars sold was less than the number of new domestic cars sold the previous year, approximately how many fewer new domestic cars were sold than in the previous year?

(A) 500,000
(B) 1,000,000
(C) 1,600,000
(D) 2,200,000
(E) 3,000,000

3. Approximately what percent of all the new cars sold retail in the United States in 1983 were imported from Japanese manufacturers other than companies *T*, *U*, and *V*?

(A) 2.9%
(B) 4.6%
(C) 6.9%
(D) 9.3%
(E) 11.5%

4. Approximately what percent of the new domestic cars sold retail in the United States in 1983 were manufactured by Company *Q*?

(A) 10%
(B) 12%
(C) 15%
(D) 17%
(E) 23%

5. Approximately how many of the new cars sold retail in the United States in 1983 were imported from West German manufacturers other than Company *W*?

(A) 32,000
(B) 119,000
(C) 156,000
(D) 192,000
(E) 275,000

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DATA INTERPRETATION PRACTICE SET 15

LAST WEEK'S TOTAL HOURS WORKED AND HOURLY WAGES FOR THE CASHIERS AT MARKET *X*

Cashier	Hourly Wage	Total Hours Worked
P	$4.25	40
Q	4.75	32
R	5.00	26
S	5.50	25
T	5.50	22

Note: Last week no more than two cashiers worked at any one time, no cashier worked more than 12 hours on the same day, and on each day each cashier worked continuously.

1. What was the average (arithmetic mean) number of hours that the five cashiers worked last week?

(A) 25
(B) 26
(C) 27
(D) 29
(E) 30

2. What is the least possible number of days on which Cashier *R* could have worked last week?

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

3. On Saturday of last week, Market *X* was open for 15 hours and exactly four cashiers worked. What was the greatest possible amount that the market could have paid in cashiers' wages for that day?

(A) $132.00
(B) $157.50
(C) $161.25
(D) $163.00
(E) $165.00

4. If Market *X* is open 96 hours per week, for how many hours last week were two cashiers working at the same time?

(A) 49
(B) 48
(C) 36
(D) 24
(E) 12

5. If Cashier *S*'s hourly wage were to increase by 10 percent and S's weekly hours were to decrease by 10 percent from last week's total hours, what would be the change, if any, in *S*'s total weekly wage?

(A) An increase of $1.37
(B) An increase of $0.55
(C) No change
(D) A decrease of $0.55
(E) A decrease of $1.37

Answer Key

Data Interpretation Practice Sets

SET 1	SET 6	SET 11
1. D	1. B	1. B
2. E	2. A	2. C
3. A	3. E	3. C
4. D	4. D	4. E
5. B	5. D	5. C
SET 2	**SET 7**	**SET 12**
1. A	1. E	1. D
2. C	2. D	2. E
3. C	3. A	3. C
4. E	4. D	4. C
5. D	5. B	5. E
SET 3	**SET 8**	**SET 13**
1. A	1. B	1. E
2. C	2. C	2. C
3. E	3. E	3. C
4. B	4. A	4. E
5. D	5. C	5. A
SET 4	**SET 9**	**SET 14**
1. C	1. D	1. A
2. D	2. B	2. D
3. E	3. B	3. B
4. E	4. D	4. E
5. D	5. A	5. B
SET 5	**SET 10**	**SET 15**
1. B	1. B	1. D
2. D	2. E	2. C
3. E	3. D	3. C
4. A	4. D	4. A
5. C	5. A	5. E

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GRE QUANTITATIVE SECTIONAL TEST

TEST 1

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes: All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as *xy*-planes and number lines, **are** drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

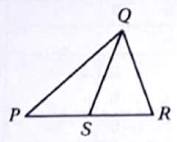
Graphical data presentations, such as bar graphs, circles graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 12, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[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.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

[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.**

Quantity A	Quantity B
$\frac{a}{b}$	$\frac{a+1}{b+1}$

The lowest common denominator of each group

Quantity A	Quantity B
$\frac{2}{3}, \frac{5}{12}, \frac{7}{8}$	$\frac{5}{6}, \frac{3}{8}, \frac{1}{2}$

$x > 0, y > 0$

Quantity A	Quantity B
$x^2 + y^2$	$(x+y)^2$

The average (arithmetic mean) of 40, 20, 30, 24, 27, and 15 is x ?

Quantity A	Quantity B
x	26

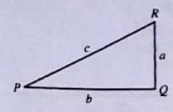
$4w = 6x = 12y$

Quantity A	Quantity B
w	y

Two concentric circles:
Diameter of inner circle is 3.5 units
Diameter of outer circle is 7 units

6.

Quantity A	Quantity B
Circumference of inner circle	$\frac{1}{2}$ of circumference of outer circle



$\angle PQR$ is obtuse

7.

Quantity A	Quantity B
$a^2 + b^2$	c^2

8.

Quantity A	Quantity B
$2(\angle x)$	$\angle A + \angle B + \angle C + \angle D$

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$w : x = y : z$, x and z are not zero

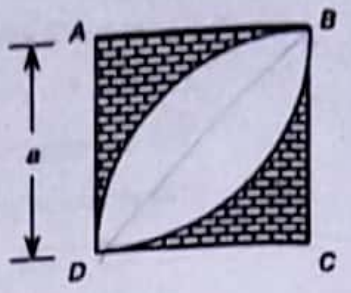
9.

Quantity A	Quantity B
$w + x$	$y + z$

Square $EFGH$ is inscribed in circle $GO \perp OH$. Area of triangle $GOH = 12.5$.

10.

Quantity A	Quantity B
Area of shaded part of figure	9π



$ABCD$ is a square.
The unshaded area represents the intersection of two quadrants. ($\pi = 3.14$)

11.

Quantity A	Quantity B
Shaded area	Unshaded area

$m > n > 1$

12.

Quantity A	Quantity B
w^n	w^m

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Questions 18 –22 refer to the charts below

United States, Area and Population

Division	area* sq mi	area* sq km	population 1970 census	population 1980 census
East North Central States	244,366 248,283	632,905 643,050	40,253,000	41,668,000
Illinois	55,877 56,400	144,721 146,075	11,114,000	11,418,000
Indiana	36,189 36,291	93,729 93,993	5,194,000	5,490,000
Michigan	56,818 58,216	147,158 150,779	8,875,000	9,258,000
Ohio	41,018 41,222	106,236 106,764	10,652,000	10,797,000
Wisconsin	54,464 56,154	141,061 145,438	4,418,000	4,705,000
East South Central States	179,427 181,964	464,714 471,285	12,804,000	14,663,000
Alabama	50,851 52,609	131,703 133,667	3,444,000	3,890,000
Kentucky	39,851 40,395	103,214 104,623	3,219,000	3,661,000
Mississippi	47,358 47,716	122,657 123,584	2,217,000	2,521,000
Tennessee	41,367 42,244	107,140 109,411	3,924,000	4,591,000
Middle Atlantic States	100,426 102,745	260,102† 266,108†	37,199,000	36,788,000
New Jersey	7,532 7,836	19,508 20,295	7,168,000	7,364,000
New York	47,869 49,576	123,980 128,401	18,237,000	17,557,000
Pennsylvania	45,025 45,333	116,614 117,412	11,794,000	11,867,000
Mountain States	856,633 863,887	2,218,669† 2,237,457†	8,281,000	11,369,000
Arizona	113,563 113,909	294,127 295,023	1,771,000	2,718,000
Colorado	103,794 104,247	268,825 269,998	2,207,000	2,889,000
Idaho	82,677 83,557	214,132 216,412	713,000	944,000
Montana	145,603 147,138	377,110 381,086	694,000	787,000
Nevada	109,889 110,540	284,611 286,297	489,000	799,000
New Mexico	121,445 121,666	314,541 315,113	1,016,000	1,300,000
Utah	82,381 84,916	213,366 219,931	1,059,000	1,461,000
Wyoming	97,281 97,914	251,957 253,596	332,000	471,000
New England States	62,992 66,608	163,149† 172,514†	11,842,000	12,349,000
Connecticut	4,870 5,009	12,613 12,973	3,032,000	3,108,000
Maine	30,933 33,215	80,116 86,026	992,000	1,125,000
Massachusetts	7,833 8,257	20,287 21,386	5,689,000	5,737,000
New Hampshire	9,003 9,304	23,395 24,097	738,000	921,000
Rhode Island	1,049 1,214	2,717 3,144	947,000	947,000
Vermont	9,274 9,609	24,020 24,887	444,000	511,000

Division	area* sq mi	area* sq km	population 1970 census	population 1980 census
Pacific States	892,266 916,728	2,310,958 2,374,315	26,522,000	31,797,000
Alaska	566,432 586,412	1,467,052 1,518,800	300,000	400,000
California	156,537 158,693	405,429 411,013	19,953,000	23,669,000
Hawaii	6,425 6,450	16,641 16,705	769,000	965,000
Oregon	96,209 96,981	249,180 251,180	2,091,000	2,633,000
Washington	66,663 68,192	172,656 176,616	3,409,000	4,130,000
South Atlantic States	267,352 278,776	692,438† 772,026	30,671,000	36,942,000
Delaware	19,822 2,057	5,133 5,328	548,000	595,000
District of Columbia††	61 67	158 174	757,000	638,000
Florida	54,136 58,560	140,212 151,670	6,789,000	9,740,000
Georgia	58,197 58,878	150,730 152,488	4,590,000	5,464,000
Maryland	9,891 10,577	25,618 27,394	3,922,000	4,216,000
North Carolina	48,880 52,586	126,599 136,197	5,082,000	5,874,000
South Carolina	30,280 31,055	78,425 80,432	2,591,000	3,119,000
Virginia	39,841 40,817	103,188 105,716	4,648,000	5,346,000
West Virginia	24,084 24,181	62,377 62,628	1,744,000	1,950,000
West North Central States	508,192 517,247	1,316,211 1,339,664	16,320,000	17,183,000
Iowa	56,043 56,290	145,151 145,790	2,824,000	2,913,000
Kansas	82,056 82,264	212,524 213,063	2,247,000	2,363,000
Minnesota	79,289 84,068	205,358 217,735	3,805,000	4,077,000
Missouri	69,046 69,686	178,828 180,486	4,677,000	4,917,000
Nebraska	76,522 77,227	198,191 200,017	1,483,000	1,570,000
North Dakota	69,280 70,665	179,434 183,022	618,000	653,000
South Dakota	75,956 77,047	196,725 199,551	666,000	690,000
West South Central States	429,284 438,884	1,111,840† 1,136,704	19,320,000	23,743,000
Arkansas	52,175 53,104	135,133 137,539	1,923,000	2,286,000
Louisiana	45,155 48,523	116,951 125,674	3,641,000	4,204,000
Oklahoma	68,984 69,919	178,668 181,089	2,559,000	3,025,000
Texas	262,970 267,338	681,089 692,402	11,197,000	14,228,000
Total United States	3,540,938 3,615,122	9,170,987 9,163,123†	203,212,000§	226,505,000§

* Where two figures are given, the first is the land area, the second the total area.
† Converted area figures do not add up to total given because of rounding.
†† District of Columbia is a federal district.
§ Figures do not add up to total given because of rounding.
Source: U.S. government figures.

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GRE QUANTITATIVE SECTIONAL TEST

TEST 2

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes: All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

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Graphical data presentations, such as bar graphs, circles graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to12, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[A] **Quantity A is greater.**

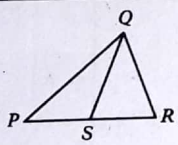
[B] **Quantity B is greater.**

[C] **The two quantities are equal.**

[D] **The relationship cannot be determined from the information given.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

[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.**

1. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| Number of minutes in $2\frac{1}{2}$ hours | Number of hours in $6\frac{1}{2}$ days |

2. 6 horses are tied with a rope of length 7 m each, at each vertex of a hexagonal field. All sides of hexagon are greater than 14 m.

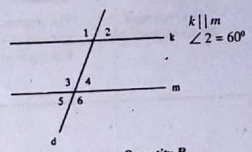
Quantity A	***Quantity B***
Area within hexagon that horses can graze (in m^2)	49π

$w : x = y : z$
$x \neq 0, z \neq 0$

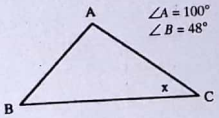
3. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| 0 | $wz - xy$ |

4. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $(1 - \sqrt{2})(1 - \sqrt{2})$ | $(1 - \sqrt{2})(1 + \sqrt{2})$ |

5. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| Distance between $A(3, 4)$ and $B(-1, 1)$ | Distance between $C(4, -2)$ and $D(-2, -2)$ |



6. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| ∠5 | 60° |



7. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| Side *AB* | Side *BC* |

8. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| Product of the roots of $x^2 + 3x - 4$ | Product of the roots of $x^2 + 4x + 4$ |

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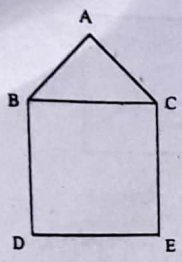

Area of triangle plus area of square = 125 and perimeter of square is 40

9. | *Quantity A* | *Quantity B* |
|---|---|
| Twice the length of line segment *BD* | The shortest distance from point *A* to line segment *DE* |

$$\frac{a+2}{a+1} = \frac{a-4}{a-3}$$

10. | *Quantity A* | *Quantity B* |
|---|---|
| Value of a | 1 |

11. | *Quantity A* | *Quantity B* |
|---|---|
| The sum of all angles of a polygon whose sides are all equal | The sum of all angles of a square |

$x < y < z$

12. | *Quantity A* | *Quantity B* |
|---|---|
| $\lvert x^2 - y^2 \rvert$ | $x^2 - z^2$ |

Questions 13 to 25 have several different formats. Unless otherwise directed, seleet a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Ouestions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

13. A runner takes nine seconds to run a distance of 132 feet. What is the runner's speed in miles per hour?

(A) 9
(B) 10
(C) 11
(D) 12
(E) 13

14. After taking four tests, Joan has an average grade of 79 points. What grade must she get on her fifth test to achieve an 83 point average?

(A) 83
(B) 86
(C) 87
(D) 95
(E) 99

15. If a triangle of base 6 units has the same area as a circle of radius 6 units, what is the altitude of the triangle?

(A) π
(B) 3π
(C) 6π
(D) 12π
(E) 36π

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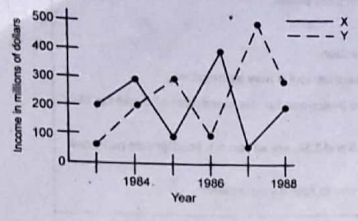
Questions 16—20 refer to the graph below.



16. What was the average income (in millions) of Company X during the years 1983 to 1986?

(A) 150
(B) 200
(C) 250
(D) 300
(E) 400

17. What was the largest difference in earnings (in millions) between the two companies in a given year?

(A) 100
(B) 200
(C) 300
(D) 400
(E) 500

18. What was the median income (in millions) of Company X from 1983 through 1988?

(A) 100
(B) 200
(C) 300
(D) 400
(E) Can't be determined

19. What was the largest percent of increase in earnings of Company *Y*?

(A) 50%
(B) 100%
(C) 200%
(D) 300%
(E) 400%

20. What was the largest percent of decrease in earnings for either one of the companies?

(A) 50%
(B) 100%
(C) 200%
(D) 75%
(E) 400%

21. Tom received 89, 94, 86, and 96 on the first four algebra tests. What grade must he receive on his last test to have an average of 92?

(A) 92
(C) 91
(B) 94
(D) 95
(E) 96

For the following question, enter your answer in the box.

22. A truck contains 150 small packages, some weighing 1 kg each and some weighing 2 kg each. How many packages weighing 2 kg each are in the truck if the total weight of all the packages is 264 kg?

23. A wheel with a diameter of 3 feet makes a revolution every 2 minutes. How many feet will the wheel travel in 30 minutes?

(A) 3π
(B) 6π
(C) 45π
(D) 30π
(E) 15π

24. A waitress's income consists of her salary and tips. Her salary is \$150 a week. During one week that included a holiday, her tips were $\frac{5}{4}$ of her salary. What fraction of her income for the week came from tips?

(A) $\frac{5}{8}$
(B) $\frac{5}{4}$
(C) $\frac{4}{9}$
(D) $\frac{1}{2}$
(E) $\frac{5}{9}$

25. Each of the integers h, m, and n is divisible by 3. Which of the following integers is always divisible by 9?

I. hm
II. $h + m$
III. $h + m + n$
(A) I only
(B) II only
(C) III only
(D) II and III only
(E) I, II, and III

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GRE QUANTITATIVE SECTIONAL TEST

TEST 3

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes: All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as xy-planes and number lines, **are** drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

Graphical data presentations, such as bar graphs, circles graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 12, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[A] **Quantity A is greater.**

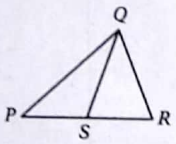
[B] **Quantity B is greater.**

[C] **The two quantities are equal.**

[D] **The relationship cannot be determined from the information given.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

[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.**

w, *x*, *y* are positive.
$w + x + y = 20$, and $w = x$

	Quantity A	Quantity B
1.	*x*	10

	Quantity A	Quantity B
2.	0	The largest even integer smaller than 2

$2x + 4y = 12$

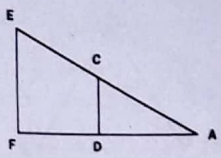
	Quantity A	Quantity B
3.	*x*	*y*

x is a positive integer

	Quantity A	Quantity B
4.	$\frac{x}{3}$	.34*x*

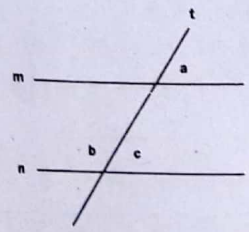
Given that $y^2 + 12y + 27 = 0$ and $x^2 - 12x + 27 = 0$.

	Quantity A	Quantity B
5.	*xy*	−6



$CD \parallel EF$
$AD = DF$
$CD = 4$
$DF = 3$

	Quantity A	Quantity B
6.	Side *EF*	7



m and *n* are parallel lines.

	Quantity A	Quantity B
7.	$\angle b$	$\angle b + \angle c - \angle a$

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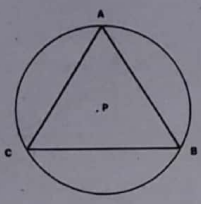
x is a positive integer.

8.

Quantity A	Quantity B
$\frac{5x+7}{x}+\frac{8x+10}{4}$	$2x+\frac{9x+14}{2x}+3$



ABC is inscribed in $\odot P$
$AB = AC$
$m\widehat{AC} = 145°$

9.

Quantity A	Quantity B
$m\angle C$	$m\widehat{CB}$

If $y > 0$

10.

Quantity A	Quantity B
If $w^2 - 2wy + y^2 = 0$, w	If $y^2 + 2xy + x^2 = 0$, x

11.

Quantity A	Quantity B
Area of an equilateral triangle with side = b	Area of an isosceles right triangle with leg = b

Tom can mow the lawn in x hours, Peter can mow the lawn in y hours, and Dan can mow the lawn in z hours. Tom and Dan together are faster than Tom and Peter together.

12.

Quantity A	Quantity B
x	z

Questions 13 to 25 have several different formats. Unless otherwise directed, seleet a single answer choice. For Numeric Entry questions, follow the instructions below.

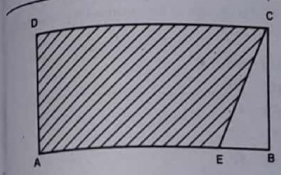
Numeric Entry Ouestions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

13. If the measures of the three angles of a triangle are $(3x + 15)°$, $(5x - 15)°$, and $(2x + 30)°$, What is the value of angle $(3x + 15)°$?

(A) 75°
(B) 60°
(C) 45°
(D) 25°
(E) 15°



14. If the length of line segment EB; base of triangle EBC, is equal to $\frac{1}{4}$ the length of line segment AB (AB is the length of rectangle $ABCD$), and the area of triangle EBC is 12 square units, find the area of the shaded region.

(A) 24 square units
(B) 96 square units
(C) 84 square units
(D) 72 square units
(E) 120 square units

15. $4\frac{1}{3} - 1\frac{5}{6} =$

(A) $3\frac{2}{3}$
(B) $3\frac{1}{2}$
(C) $2\frac{1}{2}$
(D) $3\frac{1}{6}$
(E) None of these

For the following question, enter your answer in the box.

16. The number missing in the series, 2, 6, 12, 20, x, 42, 56.

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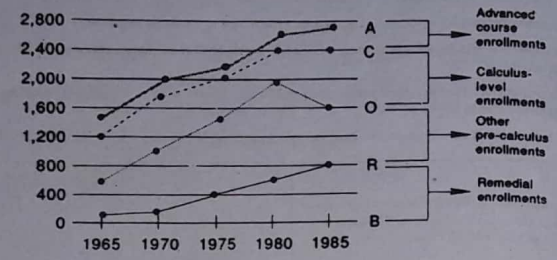
Questions 17-21 refer to the graph below.

Undergraduate Mathematics Enrollments in the US. 1965-85 (Thousands of enrollments, fall semester)



(Note: Area between base line and continuous line represents remedial enrollments; between continuous line and dotted line represents other precalculus enrollments; between dotted line and dashed line represents calculus enrollments; and between dashed line and jagged line represents advanced course enrollments.)

17. The total undergraduate mathematics enrollment in the fall of 1975 was about x thousand where x equals about
(A) 2,800.
(B) 2,000.
(C) 2,400.
(D) 2,200.
(E) 1,500.

18. In 1970, the percentage of enrollments in the remedial mathematics category was about
(A) 21.
(B) 10.5.
(C) 18.
(D) 79.
(E) 89.

19. What is the ratio of the calculus-level enrollments 1985:1975?
(A) 3:8
(B) 2:1
(C) 4:3
(D) 6:5
(E) 8:3

20. Between 1970 and 1985 the number of remedial mathematics enrollmeats
(A) increased by about 100%.
(B) increased by about 150%.
(C) increased by about 200%.
(D) increased by about 300%.
(E) increased by about 350%.

What undergraduate enrollment category was fairly constant over the period of the graph?
(A) Remedial
(B) Other precalculus
(C) Calculus level
(D) Advanced course
(E) None of the categories

What is the product of $(\sqrt{3}+6)$ and $(\sqrt{3}-2)$?
(A) $9+4\sqrt{3}$
(B) -9
(C) $-9+4\sqrt{3}$
(D) $-9+2\sqrt{3}$
(E) 9

What is the factorization of $x^2+ax-2x-2a$?
(A) $(x+2)(x-a)$
(B) $(x-2)(x+a)$
(C) $(x+2)(x+a)$
(D) $(x-2)(x-a)$
(E) None of these

For the following question, enter your answer in the box.

24. Jim is twice as old as Susan. If Jim were 4 years younger and Susan were 3 years older, their ages would differ by 12 years. What is the sum of their ages?

25. The range for $|5x-1| \le 9$ is
(A) $-\frac{8}{5} \le x \le 2$.
(B) $-\frac{9}{5} \le x \le \frac{9}{5}$.
(C) $0 \le x \le \frac{1}{5}$.
(D) $-\frac{8}{5} \le x \le \frac{9}{5}$.
(E) $-\frac{8}{5} \ge x$ and $x \ge 2$.

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GRE QUANTITATIVE SECTIONAL TEST

TEST 4

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes: All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as *xy*-planes and number lines, **are** drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

Graphical data presentations, such as bar graphs, circles graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 6, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[A] **Quantity A is greater.**

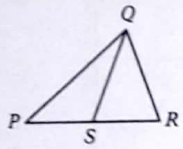
[B] **Quantity B is greater.**

[C] **The two quantities are equal.**

[D] **The relationship cannot be determined from the information given.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

[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.**

$x > y > 2, z > 0$

	Quantity A	Quantity B
1.	$\frac{1}{xy}$	$\frac{1}{xz}$

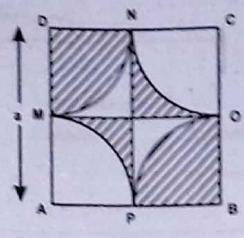
$x^2 = y + 2 = 5$

	Quantity A	Quantity B
2.	x	y

	Quantity A	Quantity B
3.	The least common multiple of 20, 24, 32	The least common multiple of 2, 15,32

$x = -y$

	Quantity A	Quantity B
4.	x	y



ABCD is a square with side *a*. *M, N, O,* and *P* are middle points. *MND, MPA, POB,* and *ONC* are four quadrants.

	Quantity A	Quantity B
5.	Shaded area	$\frac{a^2}{4}$

The length of a ruler is *L*. This value is increased by 10%, and then decreased by 10%.

	Quantity A	Quantity B
6.	*L*	Final length

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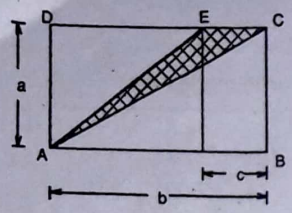
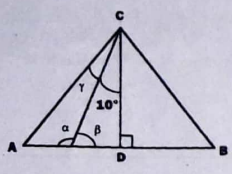


ABCD is a rectangle with $b>a$.

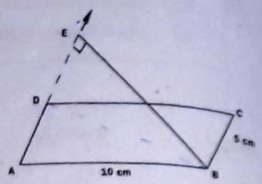
7. | **Quantity A** | **Quantity B** |
|---|---|
| Shaded area | $\frac{bc}{2}$ |



ABC is an equilateral triangle.

8. | **Quantity A** | **Quantity B** |
|---|---|
| $\alpha - \beta$ | γ |

Quadrilateral *ABCD* is a parallelogram, line segment *BE* is perpendicular to line *AD* ; the length of *line BE* is 8 cm.



9. | **Quantity A** | **Quantity B** |
|---|---|
| Area *of ABCD* | 40 cm² |

10. | **Quantity A** | **Quantity B** |
|---|---|
| $\frac{1}{5}$ of 0.2% of \$1,000 | $(\frac{1}{5})$% of 0.2 of \$1,000 |

$0 < x < 2$

11. | **Quantity A** | **Quantity B** |
|---|---|
| x^2 | x^3 |

$m > n > 0$

12. | **Quantity A** | **Quantity B** |
|---|---|
| x^m | x^n |

Questions 13 to 25 have several different formats. Unless otherwise directed, seleet a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Questions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

13. What is the value of the following expression: $\dfrac{1}{1+\dfrac{1}{1+\dfrac{1}{4}}}$

(A) $\frac{5}{9}$

(B) $\frac{9}{5}$

(C) $\frac{1}{2}$

(D) 2

(E) 4

14. The solution of the equation $4 - 5\ (2y + 4) = 4$ is

(A) $-\frac{2}{5}$

(B) 8

(C) 4

(D) -2

(E) none of these.

15. If $0 < a < 1$ and $b > 1$, which is the largest value?

(A) $\frac{a}{b}$

(B) $\frac{b}{a}$

(C) $\left(\frac{a}{b}\right)^2$

(D) $\left(\frac{b}{a}\right)^2$

(E) Cannot be determined

16. The side of a square increases 10% and the area increases 5.25(ft)². What was the original value of the side of the square?

(A) 3 ft

(B) 2 ft

(C) 1 ft

(D) 4 ft

(E) 5 ft

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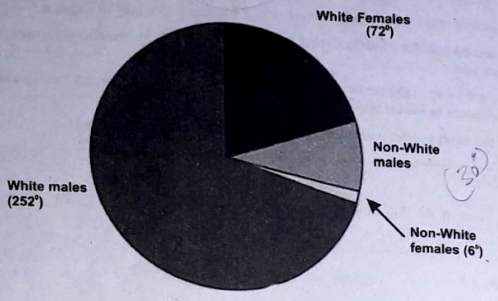
Questions 17—21 refer to the graph below.

Portion of Doctoral Degrees in the Mathematical Sciences Awarded to U.S. Citizens in 1986



For the following question, enter your answer in the box.

17. What percent of the Ph.D. degrees were awarded in 1986 to non- white males?

18. Given the distribution of doctorates awarded in Mathematical Sciences in the U.S. in 1986, what is the ratio of white male's degrees to those given to males who are not white?

(A) 1 to 8.4
(B) 3.5 to 1
(C) 8.4 to 1
(D) 42 to1
(E) None of these

19. If 4,000 doctorates were awarded in Mathematical Sciences, how many were awarded to white female U.S. citizens?

(A) 800
(B) 2,880
(C) 3,200
(D) 1,120
(E) None of these

20. If 600 white females represent 72° of the figure that depicts the total distribution of doctorates awarded in the Mathematical Sciences in the U.S. in 1986, then how many were awarded to white males?

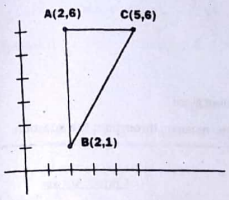
(A) 432
(B) 3,000
(C) About 857
(D) 2,100
(E) Cannot he determined

21. If the non-white female category represents 6° of the distribution of a total of 6,000 doctorates awarded in the Mathematical Sciences, then *how* many doctorates were awarded in this category?

(A) 50
(B) 100
(C) 500
(D) 1,000
(E) Cannot he determined

For the following question, enter your answer in the box.

22. I went to Lucky Duck Casino and in the first game I lost one-third of my money, in the second game I lost half of the rest. If I still have S 1,000, how much money did I have when I arrived at the Casino?



23. What is the length of side *BC*?

(A) 3
(B) 5
(C) $\sqrt{34}$
(D) 7
(E) None of these

24. What is the diameter of largest sphere that can fit inside a right circular cone of base diameter 6 m and slant height 12 m?

(A) 6
(B) $4\sqrt{3}$
(C) $6\sqrt{3}$
(D) 8
(E) 12

25. If $3^x > 1$, then x

(A) $0 < x < 1$
(B) $x \geq 0$
(C) $x \geq 1$
(D) $x > 0$
(E) $x > 1$

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GRE QUANTITATIVE SECTIONAL TEST
TEST 5

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes: All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

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Graphical data presentations, such as bar graphs, circles graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 12, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[A] **Quantity A is greater.**

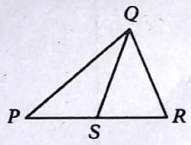
[B] **Quantity B is greater.**

[C] **The two quantities are equal.**

[D] **The relationship cannot be determined from the information given.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	[A] [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] [D] (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

[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.**

$x + 2y > 4$

1. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| x | y |

A group of 5 students reported that they earned the following amounts during summer vacation: $8,000, $9,000, $2,000, $10,000, $6,000.

2. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| Average income | Median income |

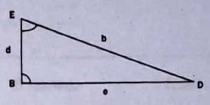
a and b are positive integers; $\frac{a}{2} > b < a$

3. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $\frac{a}{b}$ | $\frac{a+b}{a-b}$ |

Jim earns d dollars in h hours.

4. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| Jim's earnings in $(h + 20)$ hours | $\left(d + \frac{20d}{h}\right)$ dollars |

Given $\triangle BED$ with b (the measure of ED) greater than e (the measure of side BD)

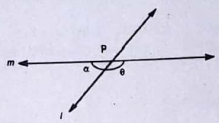


5. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| Measure of B | Measure of E |

The ratio of boys to girls in Mr. Good's class is 3 : 4 and in Ms. Garcia's class is 4 : 5. The two classes have the same number of students.

6. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| Number of boys in Mr. Good's class | Number of boys in Ms. Garcia's class |

Lines l and m intersect at point P such that the measure of $\angle\theta$ is 3 times the measure of $\angle\alpha$



7. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| Measure of $\angle\theta$ | 135° |

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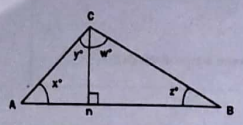
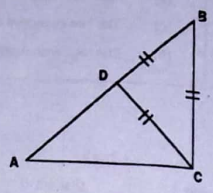
CD is perpendicular to AB.



8. | Quantity A | Quantity B |
|---|---|
| $x - y$ | $w - z$ |

9. | Quantity A | Quantity B |
|---|---|
| $\frac{x-3}{4} + \frac{x+7}{3}$ | $\frac{7x+19}{7}$ |

Line segments $BC = CD = BD$ and $BC < AC$



10. | Quantity A | Quantity B |
|---|---|
| AC | CD |

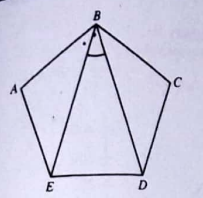
11. | Quantity A | Quantity B |
|---|---|
| Product of the roots of the equation $x^2 + 3x + 2 = 0$ | -1 |

Questions 13 to 25 have several different formats. Unless otherwise directed, seleet a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Ouestions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**



12. If $ABCDE$ is a regular pentagon, wh is the measure of $\angle EBD$?

(A) 30°
(B) 36°
(C) 45°
(D) 72°
(D) 108°

13. Tickets for a particular concert cost $5 each if purchased in advance and $7 each if bought at the box office on the day of the concert. For this particular concert, 1,200 tickets were sold and the receipts were $6,700. How many tickets were bought at the box office on the day of the concert?

(A) 500
(B) 700
(C) 600
(D) 350
(E) 200

14. A moment is randomly selected in the week. What is the probability that this moment will occur during normal business hours (Monday through Friday between 8 a.m. and 5 p.m.)?

(A) $\frac{1}{3}$
(B) $\frac{3}{8}$
(C) $\frac{5}{7}$
(D) $\frac{5}{21}$
(E) $\frac{15}{56}$

For the following question, enter your answer in the box.

15. The cost of a car repair is $220 for parts and $180 for labor. What percentage of the total repair bill is the labor?

Give your answer rounded to the nearest whole percent.

[ ] %

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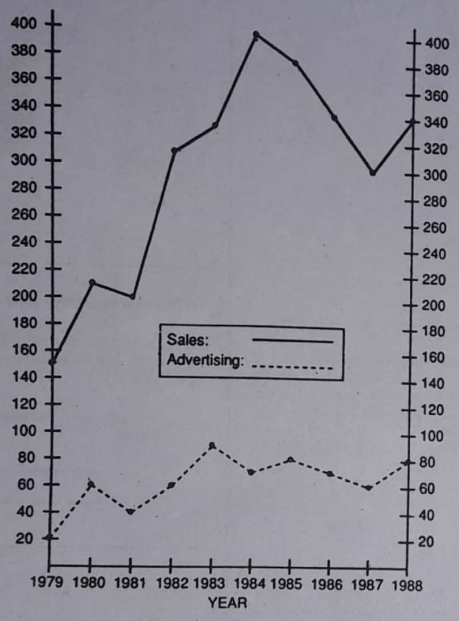
16. The most economical price among the following prices is

(A) 10 oz. for 16¢.
(B) 2 oz. for 3¢.
(C) 4 oz. for 7¢.
(D) 20 oz. for 34¢.
(E) 8 oz. for 13 ¢.

Questions **17 – 21** refer to the chart below.

The data the sales and advertising for Company B in thousands of dolllars (to the nearest ten thousand dollars).

Sales and Advertising for Company B
(In thousands of dollars – to the nearest ten thousand dollars)



17. From 1979 to 1983 inclusive, the average advertising for Company B is approximately

(A) $53,000.
(B) $60,000.
(C) $80,000.
(D) $54,000.
(E) $80,000.

18. From 1981 to 1988 inclusive, what was the amount of the greatest increase in sales from one year to the next?

(A) $70,000.
(B) $110,000.
(C) $140,000.
(D) $60,000.
(E) $40,000.

19. In how many of the years shown was advertising equal to or greater than 25% of sales?

(A) 6
(B) 5
(C) 4
(D) 3
(E) 2

20. From 1982 to 1988 inclusive, in which year did sales change by the greatest percent over the previous year?

(A) 1982
(B) 1984
(C) 1985
(D) 1986
(E) 1988

For the following question, enter your answer in the box.

21. From 1979 to 1988 inclusive, in which year did advertising increase while sales decreased over the previous year?

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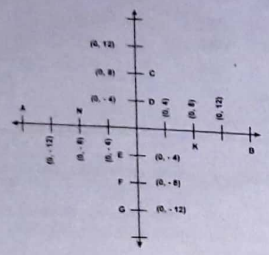
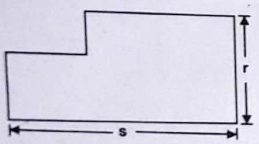
22. Line AB is the perpendicular bisector of segment CP (P is not shown). Then P is the same as which of the following points?



(A) G
(B) F
(C) H
(D) K
(E) D

23. In the figure shown, all segments meet at right angles. Find the figure's perimeter in terms of r and s.



(A) $r + s$
(B) $2r + s$
(C) $2s + r$
(D) $r^2 + s^2$
(E) $2r + 2s$

24. A postal truck leaves its station and heads for Chicago, averaging 40 mph. An error in the mailing schedule is spotted and 24 minutes after the truck leaves, a car is sent to overtake the truck. If the car averages 50 mph, how long will it take to catch the postal truck?

(A) 2.6 hours
(B) 3 hours
(C) 2 hours
(D) 1.5 hours
(E) 1.6 hours

25. $\sqrt{75} - 3\sqrt{48} + \sqrt{147} =$

(A) $3\sqrt{3}$
(B) $7\sqrt{3}$
(C) 0
(D) 3
(E) $\sqrt{3}$

GRE QUANTITATIVE SECTIONAL TEST

TEST 6

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes:

All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as *xy*-planes and number lines, **are** drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

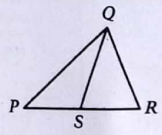
Graphical data presentations, such as bar graphs, circles graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 9, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[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.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

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[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.

1.

Quantity A	Quantity B
15% of 50	20% of 40

$d = 3.17486$ and $\boxed{-d}$ is the decimal expression for d rounded to the nearest thousandth

2.

Quantity A	Quantity B
$\boxed{d} - d$	0.001

$[x]$ = the largest integer less than or equal to x.

3.

Quantity A	Quantity B
$\frac{1}{2}[x]$	$\left[\frac{x}{2}\right]$

4.

Quantity A	Quantity B
$\sqrt{x^2}$	x

$x > 1$

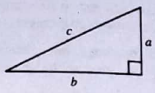
5.

Quantity A	Quantity B
$\frac{2x+10}{7}$	$x+1$

$\triangle a = 2 - a^2$

6.

Quantity A	Quantity B
$\triangle(\triangle 2)$	0



7.

Quantity A	Quantity B
$(a+b)^2$	c^2

Gail received a 7% raise last year.
Her salary is now $15,515.

8.

Quantity A	Quantity B
Gail's salary last year	$14,000

A shirt that normally costs $20 is on sale for $14

9.

Quantity A	Quantity B
The discount on the shirt, expressed as a percentage of the original price	30%

Questions 10 to 25 have several different formats. Unless otherwise directed, seleet a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Questions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

10. If a car gets 26 miles per gallon and gasoline costs $2.59 per gallon, then approximately how far can the car go on $40 of gasoline?

(A) 200 miles
(B) 300 miles
(C) 400 miles
(D) 500 miles
(E) 600 miles

11. In how many ways can 4 of 10 colors be selected where the order in which they are chosen is unimportant?

(A) 40
(B) 180
(C) 210
(D) 360
(E) 5,040

12. Two hundred milliliters of pure water is added to 300 milliliters of a solution which is 12% salt. What is the percentage of salt in the resulting solution?

(A) 6.0%
(B) 6.5%
(C) 6.9%
(D) 7.2%
(E) 7.5%

13. Tim went through 25 diapers per week for his first year and 10 diapers per week for his second and third years. How many diapers did he use in his first three years?

(A) 1,040
(B) 1,300
(C) 1,820
(D) 2,340
(E) 3,640

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For the following question, enter your answer in the box.

14. A room has dimensions 3m length, 2m width and 1.5m height. Room is to be painted from inside, excluding a window (dimensions 0.5m by 0.25m) and a door (dimensions 0.5m by 1.75m). What is the cost of painting the 4 walls and the roof, if rate of painting the room is \$2 per m^2.

\$ ☐

For this question, indicate all of the answer choices that apply.

15. If $3 : 2x = x : 6$, which of the following could be x?

(A) -3
(B) -2
(C) 1
(D) 2
(E) 3

16. If $-1 < mn < 0$, then which of the following can be true?

(A) $m < 0$ and $n < 0$
(B) $m < 1$ and $n < 1$
(C) $m > 1$ and $n < -1$
(D) $m > 1$ and $n > 1$
(E) $-1 < m < 0$ and $n < 0$

17. For which of the following values of x does $\frac{5}{3 - x}$ have the least value?

(A) 2
(B) 2.5
(C) 3.5
(D) 4
(E) 5

For the following question, select all the answer choices that apply.

18. If $0 < x < 1$, which of the following must be true?

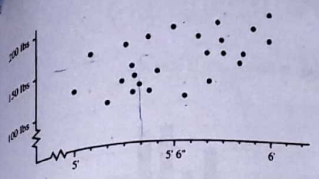
(A) $x < \frac{1}{x}$
(B) $-x < x$
(C) $x^2 < x^3$
(D) $x^2 < x$
(E) $x < x + 2$

19. In how many different ways can 3 days of the week be chosen if the order the days are chosen in does not matter?

(A) 7
(B) 14
(C) 21
(D) 28
(E) 35

20. The radius of circle A is one more than the radius of circle B. What is the difference between the circumferences of circle A and circle B?

(A) 1
(B) 2
(C) π
(D) 2π
(E) 4π



21. The dots on the graph indicate the heights and weights for a sample of 25 people. What percentage of these people are no more than 5.4" and under 150 pounds?

(A) 7%
(B) 14%
(C) 25%
(D) 28%
(E) 36%

22. How many diagonals can be drawn from one vertex of a regular octagon?

(A) 4
(B) 5
(C) 6
(D) 7
(E) 8

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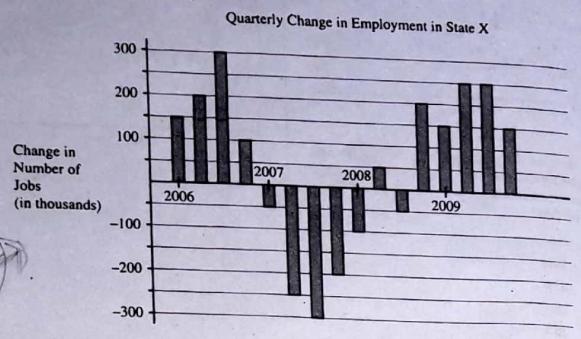
Use the following figure to answer questions 23 through 25.



For the following question, enter your answer in the box.

23. How many jobs did state X gain in the first quarter of 2009?

24. How many jobs did state X gain in the four quarters of 2006?

(A) 150,000
(B) 300,000
(C) 600,000
(D) 650,000
(E) 750,000

25. Suppose state X had 2.5 million jobs at the beginning of 2008. How many jobs did the state have at the beginning of 2007?

(A) 1.6 million
(B) 2.0 million
(C) 2.8 million
(D) 3.3 million
(E) 3.4 million

GRE QUANTITATIVE SECTIONAL TEST

TEST 7

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes:

All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

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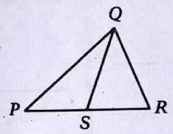
Graphical data presentations, such as bar graphs, circles graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 9, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[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.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

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[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.

1.

Quantity A	Quantity B
$9^{1.5}$	18

2.

Quantity A	Quantity B
π	3.14

3.

Quantity A	Quantity B
$8^{\frac{2}{3}}$	$\left(\frac{1}{2}\right)^{-2}$

$x^4 = 16$

4.

Quantity A	Quantity B
x	2

$$f(x) = \frac{5x^2 - 9.2x^4}{25.7 + x^6}$$

5.

Quantity A	Quantity B
$f(2.38)$	$f(-2.38)$

$xy < 0$

6.

Quantity A	Quantity B
$(x \div y)^2$	$(x - y)^2$

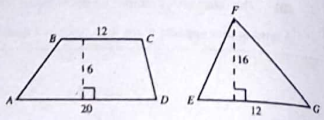
7.

Quantity A	Quantity B
$\sqrt{x+5}$	$\sqrt{x}+2$

8.

Quantity A	Quantity B
the surface area of cylindrical can with height 2 and radius 1	(A) 4π

9.



Quantity A	Quantity B
the area of trapezoid ABCD	the area of triangle EFG

Questions 10 to 25 have several different formats. Unless otherwise directed, seleet a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Ouestions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

10. How many digits are in $2^8 \times 5^{10}$, when written out completely?

(A) 8
(B) 10
(C) 13
(D) 18
(E) 80

11. 5% x 5% =

(A) 25%
(B) 2.5%
(C) 0.25%
(D) 250%
(E) 0.025%

12. What is the ratio of 7 yards to 10 feet?

(A) $\frac{7}{10}$
(B) $\frac{21}{10}$
(C) 1
(D) $\frac{11}{10}$
(E) $\frac{42}{5}$

13. Which of the following are rational numbers?

(A) -3
(B) $\frac{4}{3}$
(C) 0
(D) $\sqrt{12}$
(E) $\sqrt{16}$
(F) π

14. $\frac{x+2}{(x-1)} - \frac{x-2}{(x+1)}$

(A) 1
(B) $\frac{2x}{x^2-1}$
(C) $\frac{2(x^2+3x+2)}{x^2-1}$
(D) $\frac{6x}{x^2-1}$
(E) $2\left(\frac{x^2+2}{x^2-1}\right)$

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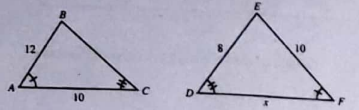
15. There are 12 people in a wedding party. How many different ways can five of them be arranged from left to right for a photograph?

(A) 60
(B) 120
(C) 792
(D) 95,040
(E) 47,901,600



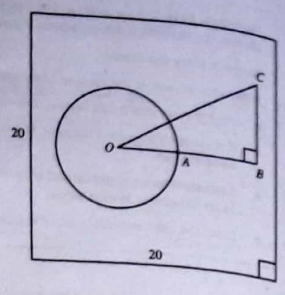
16. Find x.

(A) 6
(B) $6\frac{2}{3}$
(C) $8\frac{1}{3}$
(D) 12
(E) 15

For this question, indicate all of the answer choices that apply.

17. If $2x^2 + 5x - 3 = 0$, which of the following are possible values of x?

(A) -3
(B) $\frac{1}{2}$
(C) $\frac{3}{2}$
(D) 2
(E) 3



18. O is the center of the circle. A is the midpoint of line OB. $OB = BC = 8$. If a point is randomly chosen from the square, what is the probability it will be in both the circle and the triangle?

(A) $\frac{1}{25}$
(B) $\frac{\pi}{25}$
(C) $\frac{4}{25}$
(D) $\frac{\pi}{100}$
(E) $\frac{\pi}{200}$

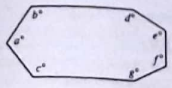
19. Which of the following points is closest to $(9, -4)$?

(A) (8, 5)
(B) (10, 2)
(C) (5, 5)
(D) (2, – 2)
(E) (4, 6)

A sock drawer contains 12 black socks and 8 white socks. What is the probability that two socks drawn out randomly will be the same color ?

(A) $\frac{1}{6}$
(B) $\frac{13}{25}$
(C) $\frac{47}{95}$
(D) $\frac{49}{96}$
(E) $\frac{2}{3}$

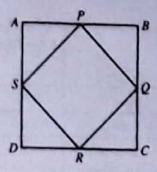
For the following question, enter your answer in the box.



21. $a° + b° + c° + d° + e° + f° + g° =$

°

For this question, write your answer in the box.



22. Square $ABCD$ has area 50 square units. Points P, Q, R and S are the midpoints of sides AB, BC, CD and DA, respectively. What is the area of quadrilateral $PQRS$?

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Use the following figure to answer questions **23** through **25**

Budget Changes 2000–2005

	Education	Transportation	Health	Police	Other
State (A)	– 3%	+1%	– 4%	+1%	– 2%
State (B)	+4%	+10%	– 5%	+1%	– 10%
State (C)	+1%	– 3%	+1%	– 1%	– 5%
State (D)	– 1%	– 2%	– 2%	0%	– 1%

23. If state B spent $380 million on education in 2005, how much did that state spend in 2000 (rounded to the nearest tenth of a million)?

(A) $364.8 million
(B) $365.4 million
(C) $368.9 million
(D) $391.4 million
(E) $395.2 million

For this question, indicate all of the answer choices that apply.

24. Which of the following must be true?

(A) The total budget of state B was the same in 2000 and 2005
(B) The total budget of state D was lower in 2005 than it was in 2000
(C) If state A spent as much in 2000 on health and education combined as on the police, then the total spent on those three areas in 2005 was the same as in 2000.

25. Suppose that from 2005 to 2010, state C increases spending in all areas by 3%. How much will state C spend in 2010 on transportation, as a percentage of its spending in 2000 (rounded to the nearest tenth of a percent)?

(A) 99.9%
(B) 100%
(C) 100.1%
(D) 103%
(E) 106%

GRE QUANTITATIVE SECTIONAL TEST
TEST 8

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes:

All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities shown as lengths and angle measures are as they appear in a figure. You should assume, however, that lines geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as *xy*-planes and number lines, are drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

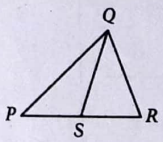
Graphical data presentations, such as bar graphs, circles graphs, and line graphs, are drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 9, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[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.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

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[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.

1. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $8^{2/3}$ | $16^{1/2}$ |

2. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| -3^2 | $(-3)^2$ |

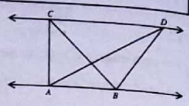
3. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| the largest prime factor of 351 | the greatest common factor of 42 and 140 |

4. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $\frac{x+7}{x+1}$ | $\frac{x+3}{x-1}$ |

5. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $(x-1)(x+1)$ | $(x+3)(x-3)$ |

$|x| < 1$

6. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| x^2 | x^3 |



$AB \parallel CD$

7. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| the area of triangle ABC | the area of triangle ABD |

x, x^2, and $\sqrt{x}$ are distinct odd integers less than 100

8. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $x + 5$ | $2x$ |

9. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| the number of different sequences of 5 letters from an alphabet of 26 letters | the number of different sequences of 8 digits |

Questions 10 to 25 have several different formats. Unless otherwise directed, seleet a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Ouestions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

10. What is the smallest natural number which is a multiple of all the numbers from 1 through 10 (inclusive)?

(A) 55
(B) 2,520
(C) 5,040
(D) 12,600
(E) 3,628,800

For the following question, select all the answer choices that apply.

11. Which are between $0.\overline{41}$ and $0.5\overline{2}$?

(A) 0.525
(B) 0.411
(C) 0.424
(D) 0.409
(E) 0.519

12. A regular polygon will be drawn with a number of sides randomly chosen from the whole numbers 3 through 10. What is the probability that the internal angles will be greater than 110°?

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

13. The information on a cereal box states that 28 grams of cereal contains 45% of the daily recommended amount of iron. How much of this cereal must be eaten in order to obtain 100% of the daily recommended amount of iron? Round your answer to the nearest gram.

(A) 62 g
(B) 63 g
(C) 64 g
(D) 65 g
(E) 66 g

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14. Uranium is present in seawater at a concentration of 3 parts per billion. If a process is available to extract this uranium, how many kilograms of seawater would need to be processed in order to obtain 50 kilograms of uranium? Round your answer to two significant digits.

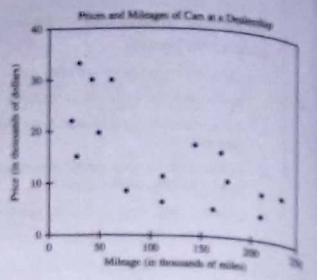
(A) 17 million kilograms
(B) 150 million kilograms
(C) 17 billion kilograms
(D) 150 billion kilograms
(E) 17 trillion kilograms

15. A play has two roles for men and four roles for women. If five men and 12 women tryout for these parts, in how many different ways can the director choose people for the roles?

(A) 60
(B) 480
(C) 4,950
(D) 59,400
(E) 237,600

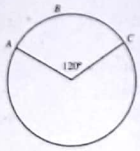
16. Which of the following data sets has the largest standard deviation?

(A) 7, 6, 8, 4, 5
(B) 7, 9, 6, 9, 8
(C) 12, 13, 17, 14, 13
(D) 1, 2, 9, 8, 9
(E) 3, 3, 3, 4, 3



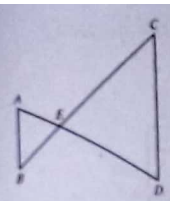
17. If a car at the dealership has less than 100,000 miles on it, what is the probability that it costs less than $25,000? Round your answer to the nearest percent.

(A) 50%
(B) 57%
(C) 63%
(D) 67%
(E) 71%



18. If arc ABC measures 8π, what is the area of the circle?

(A) 12π
(B) 16π
(C) 24π
(D) 144π
(E) 256π



$\overline{AB} \parallel \overline{CD}$, $AB = 5$, $AE = 7$, and $ED = 10$

What is CD?

(A) $5\frac{1}{2}$
(B) $7\frac{1}{7}$
(C) $8\frac{1}{3}$
(D) $10\frac{5}{7}$
(E) 14

19. What is the area of an equilateral triangle with a side of length 2?

(A) $\sqrt{3}$
(B) 2
(C) $2\sqrt{3}$
(D) 3
(E) $3\sqrt{3}$

For the following question, select all the answer choices that apply.

21. Triangle PQR is isosceles and $\angle PQR$ measures 50°. Which of the following could be the measure of $\angle PRQ$?

(A) 60°
(B) 65°
(C) 80°
(D) 100°
(E) 130°

For the following question, select all the answer choices that apply.

22. If $3x^2 + 3 = 2x^2 - x + 15$, which of the following are possible values of x?

(A) –4
(B) –2
(C) 2
(D) 3
(E) 4

For the following question, select all the answer choices that apply.

23. Which of the following are factors of 240?

(A) 6
(B) 9
(C) 12
(D) 20
(E) 36
(F) 45

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wing figure to answer questions 24 and 25.

Monthly Production (in thousands)
Product

Factory	A	B	C	D	E
W	15	12	17	9	14
X	8	9	6	7	5
Y	0	5	31	0	0
Z	6	4	5	9	1

For the following question, enter your answer in the box.

24. How much of product **C** is made in factory **Z** each year?

For the following question, enter your answer in the box.

25. What percentage of the monthly production of product **D** is made in factory **X**?

%

GRE QUANTITATIVE SECTIONAL TEST
TEST 9

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes:

All numbers used are real numbers.

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Graphical data presentations, such as bar graphs, circles graphs, and line graphs, are drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 9, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[A] **Quantity A is greater.**

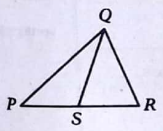
[B] **Quantity B is greater.**

[C] **The two quantities are equal.**

[D] **The relationship cannot be determined from the information given.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

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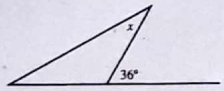
[A] Quantity A is greater.
[B] Quantity B is greater.
[C] The two quantities are equal.
[D] The relationship cannot be determined from the information given.

A job involves working 40 hours per week, 50 weeks per year

1. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $20 per hour | $40,000 per year |

2. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $\frac{2}{3}+5$ / $1-\frac{1}{6}$ | $8+\frac{1}{4}$ / $\frac{3}{4}+1$ |



3. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| x | 36° |

4. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $(2x+1)(2x-1)-(x^2+1)$ | $3x^2$ |

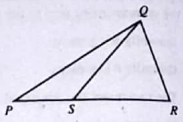
x, $2y$, and $2z-1$ are consecutive integers

5. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| y | z |

There are 14 girls and eight boys in a classroom

6. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| the number of ways to choose two of the girls | the number of ways to choose three of the boys |

7. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| the sum of the areas of two circles 10 inches in diameter | the area of a circle 16 inches in diameter |



$PQ = QR$

8. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| the measure of $\angle QRS$ | the measure of $\angle QSR$ |

For the following question, select all the answer choices that apply.

9. Which of the following equations are for lines which are perpendicular to the line $y = 2x + 4$?

(A) $2y + x = 5$
(B) $2y - x = 3$
(C) $x + 2y = 7$
(D) $x - 2y = 4$
(E) $4y + 2x = 0$

For the following question, select all the answer choices that apply.

10. Which of the following are less than 99?

(A) 30% of 200
(B) 20% less than 150
(C) 20% more than 80
(D) 60% of 150
(E) 320% of 40

11. $(99-98-97-96-95)-(100-99-98-97-96)=$

(A) -2
(B) 1
(C) 2
(D) 3
(E) 4

Questions 10 to 25 have several different formats. Unless otherwise directed, seleet a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Ouestions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

12. Among 23,280 discarded lottery tickets, about 1.80% are found to be worth $1, about 0.02% are found to be worth $2, and all the rest are worthless. Approximately how much are all the lottery tickets worth?

(A) $400
(B) $425
(C) $450
(D) $500
(E) $525

13. A teacher has two classes. In the first class, there are 14 students. In the second class, there are 22 students. The mean age of the first class is 25. The mean age of the second class is 19. What is the mean age of the two classes put together (rounded to the nearest tenth)?

(A) 20.9
(B) 21.3
(C) 21.7
(D) 22.0
(E) 22.6

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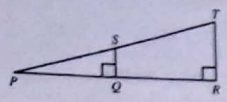
For the following question, enter your answer in the box.



$PQ = 6$, $QR = 9$, and $QS = 5$

14. RT =

For this question, indicate all of the answer choices that apply.

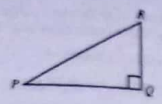
15. If $n = 6 \times 15$, which of the following are prime factors of n?

(A) 2
(B) 3
(C) 7
(D) 9
(E) 15

---

16. If gasoline costs \$2.79 per gallon, then approximately how much will it cost to drive 100 miles in a truck that gets 18 miles per gallon?

(A) \$15
(B) \$20
(C) \$25
(D) \$30
(E) \$35



$PQ = QR = 5$

17. What is the perimeter of triangle PQR?

(A) $5\sqrt{2}$
(B) $10 + 5\sqrt{2}$
(C) 15
(D) 25
(E) $10 + \sqrt{2}$

---

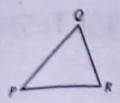
18. If $\frac{36^x}{3^{11}}$ is an integer, what is the smallest possible integer value of x?

(A) 1
(B) 4
(C) 6
(D) 11
(E) 12

---

19. Let $x <> y = y^2 - 2x$. What is the value of $5 <> 2$?

(A) -6
(B) -1
(C) 1
(D) 10
(E) 21

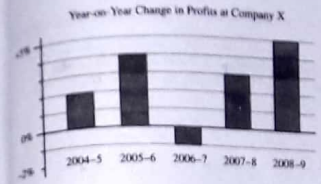


$PQ = QR$ and $\angle PQR = 30°$

What is the measure of $\angle QPR$?

(A) 30°
(B) 60°
(C) 75°
(D) 120°
(E) 150°

Use the following figure to answer questions 21 through 23.



21. What was the overall percentage change in profits at company X from 2007 to 2009?

(A) 2%
(B) 3.15%
(C) 8%
(D) 8.15%
(E) 15%

---

22. If company X made a profit of \$25 million in 2005, what was its profit in 2006?

(A) \$25.04 million
(B) \$25.4 million
(C) \$26 million
(D) \$26.25 million
(E) \$29 million

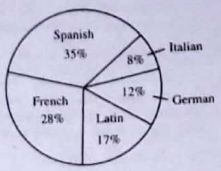
For this question, indicate all of the answer choices that apply.

23. Which of the following statements are true?

(A) Company X's change in profits from 2005 to 2007 was exactly the same as from 2007 to 2008.
(B) If company X made \$10 million in profit in 2004, then it lost money from 2006 to 2007.
(C) If company X made a \$15 million profit in 2006, then it made more than \$14 million in 2005.

Use the following figure to answer questions 24 and 25.

Languages Studied by Students at X High School



For this question, write your answer in the box.

24. Suppose there are 1,400 students studying foreign languages at X High School and no student studies more than one language. How many study French?

---

25. What is the angle of the sector representing the students who study Spanish?

(A) 35°
(B) 100.8°
(C) 120°
(D) 126°
(E) 135°

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GRE QUANTITATIVE SECTIONAL TEST

TEST 10

Time: 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes: All numbers used are real numbers.

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For each of Questions 1 to 9, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[A] **Quantity A is greater.**

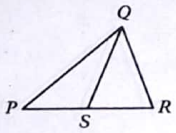
[B] **Quantity B is greater.**

[C] **The two quantities are equal.**

[D] **The relationship cannot be determined from the information given.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	[A] [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] [D] (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

[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.**

1.

Quantity A	***Quantity B***
30 cents per ounce	5 dollars per pound

2.

Quantity A	***Quantity B***
$\frac{1}{\sqrt{6}}$	$\frac{\sqrt{2}}{2\sqrt{3}}$

$P(x)$ = the number of distinct prime factors of x

3.

Quantity A	***Quantity B***
$P(350)$	$P(120)$

4.

Quantity A	***Quantity B***
Standard deviation of set {1, 10, 100, 1000, 10000}	Standard deviation of set with range equal to 10

5.

Quantity A	***Quantity B***
$\sqrt[5]{5^7}$	$(\sqrt[3]{5})^7$

For non-zero numbers a and b, operation $\triangle$ is defined as: $a \triangle b = ab$ (if $ab > 0$), and $a \triangle b = a/b$ (if $ab < 0$). Given p is a nonzero number.

6.

Quantity A	***Quantity B***
$p \triangle 1$	p

7.

Quantity A	***Quantity B***
the area of a triangle with height $\frac{2}{3}$ and base $\frac{3}{4}$	the area of a square with side $\frac{1}{2}$

In NYC High School, 20% students are Indian. In XII standard, 25% students are Indian.

8.

Quantity A	***Quantity B***
probability that a randomly selected student from school is Indian given that he (or she) is from XII standard	20%

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Questions 10 to 25 have several different formats. Unless otherwise directed, seleet a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Ouestions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

9. Which of the following is closest to $\sqrt{60}$?

(A) 2
(B) 4
(C) 8
(D) 10
(E) 20

For questions 11 and 12, indicate all of the answer choices that apply.

10. Which of the following points are on the straight line through (1, 4) and (3, –2)?

(A) (2, 1)
(B) (0, 5)
(C) (4, –5)
(D) (–1, 8)
(E) (5, 5)

11. If the radius of a circle is increased by 40%, how much will the area increase?

(A) 16%
(B) 20%
(C) 40%
(D) 80%
(E) 96%

12. In college basketball, a player awarded a "one-and-one" gets to shoot one free throw and, if successful, shoot a second one. Each successful free throw is worth one point. Suppose a player succeeds at free throws 80% of the time. On average, how many points should this player expect to score for each one-and-one?

(A) 1
(B) 1.16
(C) 1.28
(D) 1.44
(E) 1.6

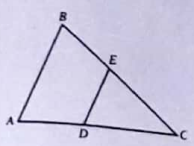
12. When a store processes a credit-card payment, they are charged a fee of 25 cents plus 2.6% of the total. If a store processes 4,000 credit card payments for a total of $150,000, how much will they be charged in fees?

(A) $4,900
(B) $7,650
(C) $13,900
(D) $40,000
(E) $103,900

For this question, indicate all of the answer choices that apply.

14. Select all the values of x which make the following true: $2x^4 = 7x^3 + 4x^2$

(A) 0
(B) $\frac{1}{2}$
(C) –1
(D) 2
(E) 4



15. Suppose D is the midpoint of AC and E is the midpoint of BC. If triangle DEC has an area of 8 square inches, what is the area of triangle ABC?

(A) 12
(B) 16
(C) 24
(D) 32
(E) 64

16. Prizes will be randomly awarded to three different people in a room of 50 people. If you are one of these people, what is the probability that you will win one of the prizes?

(A) 2%
(B) 3%
(C) 4%
(D) 5%
(E) 6%

17. What is the mean of all the two-digit positive integers?

(A) 50
(B) 54
(C) 54.5
(D) 55
(E) 55.5

18. How many diagonals can be drawn on a regular pentagon?

(A) 5
(B) 6
(C) 7
(D) 8
(E) 9

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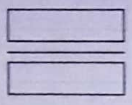
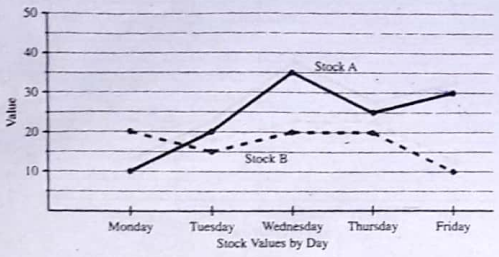
For the following question, write your answer in the boxes.

19. If two cards are drawn randomly out of a standard deck of 52 playing cards, what is the probability that both are aces? Write your answer as a fraction.



Use the following figure to answer questions 20 and 21.



20. On which day was the difference between the values of stock A and stock B greatest?

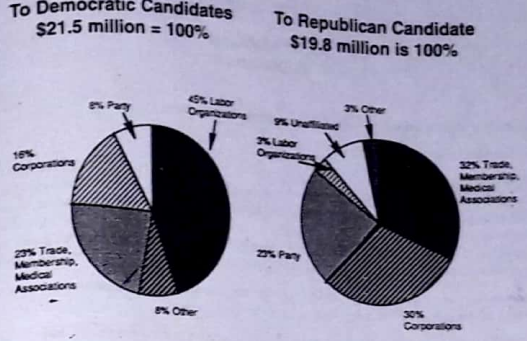
(A) Monday
(B) Tuesday
(C) Wednesday
(D) Thursday
(E) Friday

21. Over which time period did the value of stock A experience the biggest percentage change?

(A) Monday to Tuesday
(B) Tuesday to Wednesday
(C) Wednesday to Thursday
(D) Thursday to Friday
(E) More than one of the above

Questions 22 – 25 refer to the following graphs.

The data represents contributions to federal candidates for public office in the late 1970s.



22. What is the average percent of contributions to Republican candidates that come from trade, membership, and medical associations?

(A) 23%
(B) 55%
(C) 32%
(D) 9%
(E) 45%

23. What is the average dollar amount (in millions) of support for Democratic candidates that come from the party?

(A) $0.08 million
(B) $1.72 million
(C) $2.3 million
(D) $5.5 million
(E) $1.5 million

24. What is the ratio of the percent contributions of Labor organizations of the Republican candidates to the Democratic candidates?

(A) 1:15
(B) 15:1
(C) 6:100
(D) 3:8
(E) 9:10

25. What is the difference (in millions of dollars) between the average dollar amount of support to Democratic candidates and the average dollar amount of support to Republican candidates that come from labor organizations?

(A) $9.81 million
(B) $9.675 million
(C) $9.081 million
(D) $8.316 million
(E) $8.215 million

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GRE QUANTITATIVE SECTIONAL TEST

TEST 11

Time : 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes: All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as *xy*-planes and number lines, **are** drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

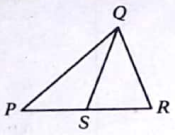
Graphical data presentations, such as bar graphs, circles graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 10, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[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.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

[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.**

1. | ***Quantity A*** | ***Quantity B*** |
   |---|---|
   | 3^4 | 4^3 |

$x = 2y + 3$
$y = -2$

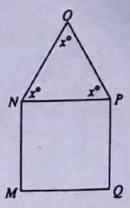
2. | ***Quantity A*** | ***Quantity B*** |
   |---|---|
   | x | -1 |

$d = 5.03894$ and $\boxed{d}$ is the decimal expression for d rounded to the nearest thousandth.

3. | ***Quantity A*** | ***Quantity B*** |
   |---|---|
   | The number of decimal places where d and $\boxed{d}$ differ | 4 |

$x + 2y > 8$

4. | ***Quantity A*** | ***Quantity B*** |
   |---|---|
   | $2x + 4y$ | 20 |



Square *MNPQ* has area 36.

5. | ***Quantity A*** | ***Quantity B*** |
   |---|---|
   | The perimeter of pentagon *MNOPQ* | 30 |

p and *q* are different prime numbers. *r* is the least prime number greater than *p*, and *s* is the least prime number greater than *q*.

6. | ***Quantity A*** | ***Quantity B*** |
   |---|---|
   | $r - p$ | $s - q$ |

$|3| = -m$

7. | ***Quantity A*** | ***Quantity B*** |
   |---|---|
   | m | 3 |

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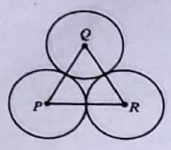
[A] Quantity A is greater.
[B] Quantity B is greater.
[C] The two quantities are equal.
[D] The relationship cannot be determined from the information given.



Equilateral triangle PQR is formed by joining centers P, Q, and R of the circles. Each pair of circles has exactly one point in common.

8.

Quantity A	***Quantity B***
The perimeter of triangle PQR	The circumference of the circle with center Q

n is an even integer and a multiple of 3.

9.

Quantity A	***Quantity B***
The remainder when n is divided by 12	6

10.

Quantity A	***Quantity B***
The volume of a cylindrical tank that has a radius of 2 meters and a height of 10 meters	The volume of a cylindrical tank that has a radius of 1 meter and a height of 20 meters

Questions 11 to 25 have several different formats. Unless otherwise directed, select a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Questions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

11. $(19 - 18 - 17 - 16) - (20 - 19 - 18 - 17) =$

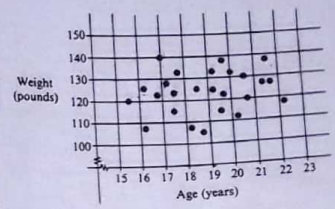
(A) -36
(B) -6
(C) -4
(D) 1
(E) 2

For the following question, enter your answer in the box.

12. If $3x - 2 = 7$, then $4x =$

13. Of the following, which is closest to $\sqrt{30}$?

(A) 6
(B) 5
(C) 4
(D) 3
(E) 2



14. The dots on the graph above indicate age and weight for a sample of 25 students. What percent of these students are less than 19 years old and weigh more than 110 pounds?

(A) 36%
(B) 40%
(C) 44%
(D) 48%
(E) 52%

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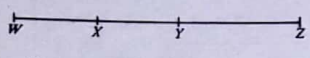
15. If $0 < st < 1$, then which of the following can be true?

(A) $s < -1$ and $t > 0$
(B) $s < -1$ and $t < -1$
(C) $s > -1$ and $t < -1$
(D) $s > 1$ and $t < -1$
(E) $s > 1$ and $t > 1$



16. On segment WZ above, if $WY = 21$, $XZ = 26$, and YZ is twice WX, what is the value of XY?

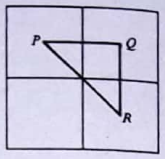
(A) 5
(B) 10
(C) 11
(D) 16
(E) It cannot be determined from the information given.

17. To reproduce an old photograph, a photographer charges x dollars to make a negative, $\frac{3x}{5}$ dollars for each of the first 10 prints, and $\frac{x}{5}$ dollars for each print in excess of 10 prints. If \$45 is the total charge to make a negative and 20 prints from an old photograph, what is the value of x?

(A) 3
(B) 3.5
(C) 4
(D) 4.5
(E) 5

18. Which of the following is equal to 25 percent of 0.01 percent?

(A) 0.000025
(B) 0.00025
(C) 0.0025
(D) 0.025
(E) 0.25



19. In the figure above, each of the four squares has sides of length x. If $\triangle PQR$ is formed by joining the centers of three of the squares, what is the perimeter of $\triangle PQR$ in terms of x?

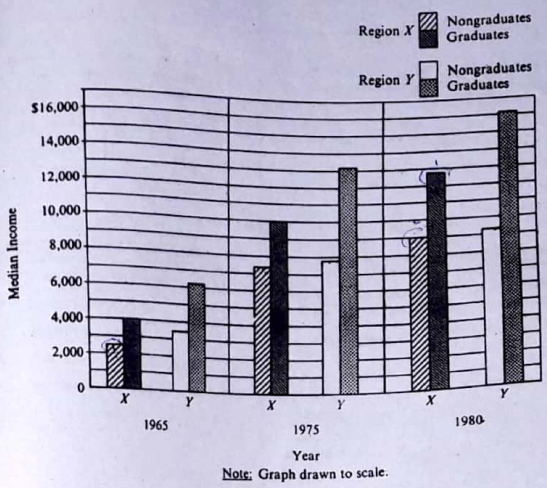
(A) $2x\sqrt{2}$
(B) $\frac{x\sqrt{2}}{2} + x$
(C) $2x + \sqrt{2}$
(D) $x\sqrt{2} + 2$
(E) $2x + x\sqrt{2}$

20. The greatest number of diagonals that can be drawn from one vertex of a regular 6-sided polygon is

Questions 21-25 refer to the following graph.

DATA INTERPRETATION PRACTICE SET 4

MEDIAN INCOME OF COLLEGE GRADUATES *VS.* NONGRADUATES IN REGIONS *X* AND *Y*



Note: Graph drawn to scale.

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21. The median income of graduates in Region X in 1960 was most nearly equal to the median income of

(A) graduates in Region X in 1975
(B) graduates in Region Y in 1975
(C) graduates in Region Y in 1960
(D) non graduates in Region X in 1960
(E) non graduates in Region Y in 1960

22. For non graduates in Region X, the median income in 1960 was approximately how many times as great as it was in 1965?

(A) 2
(B) 2.5
(C) 3
(D) 3.5
(E) 5

23. Of the following 1960 median-income ratios, the greatest was the ratio of the median incomes of

(A) graduates in Region Y to graduates in Region X
(B) non graduates in Region Y to non graduates in Region X
(C) graduates in Region Y to non graduates in Region Y
(D) graduates in Region X to nongraduates in Region Y
(E) graduates in Region X to nongraduates in Region Y

24. From 1965 to 1975 in Region X, the increase in the median income of graduates was how much more than that of non graduates?

(A) $5,000
(B) $3,000
(C) $2,500
(D) $2,000
(E) $1,000

25. For how many of the four categories given did the median income increase by at least 30 percent from 1975 to 1960?

(A) None
(B) One
(C) Two
(D) Three
(E) Four

GRE QUANTITATIVE SECTIONAL TEST

TEST 12

Time : 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes:

All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as *xy*-planes and number lines, are drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

Graphical data presentations, such as bar graphs, circles graphs, and line graphs, are drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 10, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[A] **Quantity A is greater.**

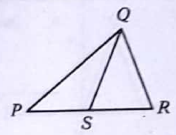
[B] **Quantity B is greater.**

[C] **The two quantities are equal.**

[D] **The relationship cannot be determined from the information given.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

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[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.

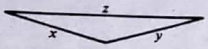
1.

Quantity A	Quantity B
4^{n+2}	$(2n + 1)(2n - 1)$

a and b are both greater than 0 and less than 1.

2.

Quantity A	Quantity B
$a^2 + b^2$	$a + b$

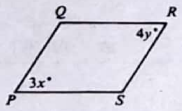


3.

Quantity A	Quantity B
$x + y$	z

4.

Quantity A	Quantity B
3^x	4^x



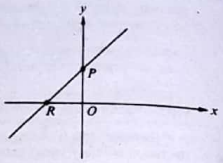
$PQRS$ is a parallelogram.

5.

Quantity A	Quantity B
x	y

6.

Quantity A	Quantity B
The sum of all the integers from 19 to 59, inclusive	The sum of all the integers from 22 to 60, inclusive



The equation of the line graphed on the rectangular coordinate system above is:

$$y = \frac{8x}{9} + 3$$

7.

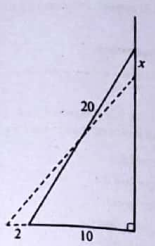
Quantity A	Quantity B
PO	RO

$0 > a > b$

8.

Quantity A	Quantity B
ab	$(ab)^2$

[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.



A 20-foot ladder leaning against a vertical wall with the base of the ladder 10 feet from the wall is pulled 2 feet farther out from the wall, causing the top of the ladder to drop x feet.

9.

Quantity A	Quantity B
x	2

10.

Quantity A	Quantity B
$\frac{99^9}{9^{99}}$	$\frac{11^9}{9^{90}}$

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Questions 11 to 25 have several different formats. Unless otherwise directed, select a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Questions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes–one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

11. If the sales tax on an appliance priced at \$300 is between 5 percent and 8 percent, then the cost (price plus sales tax) of the appliance could be

(A) \$310
(B) \$312
(C) \$314
(D) \$318
(E) \$325

12. $2[2x + (3x + 5x)] - (3x + 5x) =$

(A) $4x$
(B) $8x$
(C) $10x$
(D) $12x$
(E) $22x$

13. Which of the following is the product of two positive integers whose sum is 3?

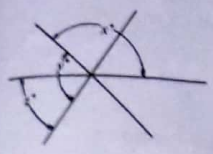
(A) 0
(B) 1
(C) 2
(D) 3
(E) 4

14. If an integer y is subtracted from an integer x and the result is greater than x, then y must be

(A) equal to x
(B) less than 0
(C) less than x
(D) greater than 0
(E) greater than x

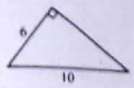
15. A circle with radius 2 is intersected by a line at points R and T. The maximum possible distance between R and T is

(A) 1
(B) 2
(C) π
(D) 4
(E) 4π



16. In the figure above, if $x = 110$ and $y = 120$, then $z =$

(A) 10
(B) 40
(C) 50
(D) 60
(E) 70



17. What is the area of the triangular region above?

(A) 24
(B) 30
(C) 40
(D) 48
(E) 60

For the following question, enter your answer in the box.

18. A widow received $\frac{1}{3}$ of her husband's estate, and each of her three sons received $\frac{1}{3}$ of the balance. If the widow and one of her sons received a total of \$60,000 from the estate, what was the amount of the estate?

\$ ☐

19. If $\frac{x+2}{y-3} = 0$, which of the following must be true?

(A) $x = 2$ and $y = 3$
(B) $x = 2$ and $y \neq 3$
(C) $x = 0$ and $y = 0$
(D) $x = -2$ and $y = 3$
(E) $x = -2$ and $y \neq 3$

20. If $x = 0.888$, $y = \sqrt{0.888}$, and $z = (0.888)^2$, then which of the following is true?

(A) $x < y < z$
(B) $x < z < y$
(C) $y < x < z$
(D) $y < z < x$
(E) $z < x < y$

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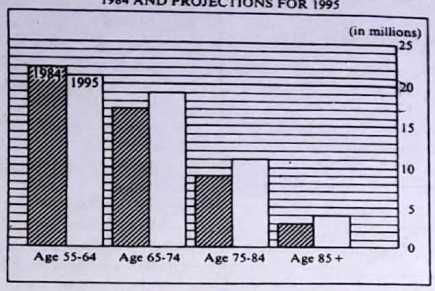
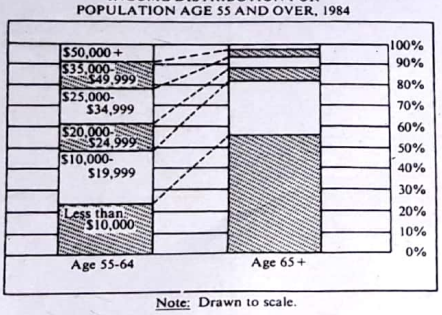
Questions 21-25 refer to the following graph

DATA INTERPRETATION PRACTICE SET 7

POPULATION OF THE UNITED STATES AGE 55 AND OVER, 1984 AND PROJECTIONS FOR 1995



INCOME DISTRIBUTION FOR POPULATION AGE 55 AND OVER, 1984



Note: Drawn to scale.

21. The age category that is projected to decrease from 1984 to 1995 is projected to have approximately how many million people in 1995?

(A) 17
(B) 18
(C) 21
(D) 23
(E) 24

22. In 1984 the median income for a person in the 55-64 age category was in which of the following intervals?

(A) Less than $10,000
(B) 10,000 – $19,999
(C) $20,000 – $24,999
(D) $25,000 – $34,999
(E) $35,000 – $49,999

23. If it is projected that the population age 55 and over will comprise of the total population in 1995, then the total population is projected to be approximately how many million in 1995?

(A) 55
(B) 58
(C) 53
(D) 65
(E) 60

24. In 1984 approximately how many more people age 55-64 had incomes less than $10,000 than had incomes of $50,000 or more?

(A) 2.2 million
(B) 3.3 million
(C) 4.4 million
(D) 5.5 million
(E) 11.0 million

25. For the age category that is projected to have the largest percent increase from 1984 to 1995, approximately what is the projected percent increase in population?

(A) 10%
(B) 15%
(C) 20%
(D) 25%
(E) 35%

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GRE QUANTITATIVE SECTIONAL TEST

TEST 13

Time : 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes: All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as *xy*-planes and number lines, **are** drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

Graphical data presentations, such as bar graphs, circles graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 10, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

[A] **Quantity A is greater.**

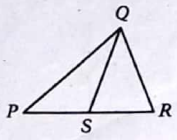
[B] **Quantity B is greater.**

[C] **The two quantities are equal.**

[D] **The relationship cannot be determined from the information given.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



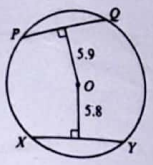
	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

[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.**



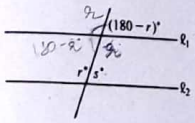
Circle with center *O*

1. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| The length of chord *PQ* | The length of chord *XY* |

$\frac{n}{x} = 428$ and $\frac{n}{y} = 107$

$n > 0$

2. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| *x* | *y* |



$\ell_1 \parallel \ell_2$

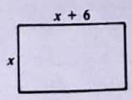
3. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| *s* | 60 |

6 is x percent of 24.
y is 25 percent of 96.

4. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| *x* | *y* |

$2x + y < 3$
$x > 2$

5. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| *y* | 0 |



The perimeter of square *S* is equal to the perimeter of the rectangle above.

6. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| The length of a side of *S* | $x + 3$ |

$0 < a < b < c$

7. | ***Quantity A*** | ***Quantity B*** |
|---|---|
| $\frac{b}{a}$ | $\frac{c}{b}$ |

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[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.

C is a circle with radius 3.

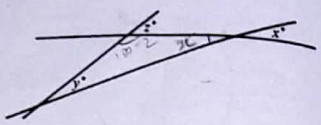
8.

Quantity A	*Quantity B*
The ratio of the circumference of C to the diameter of C	3

$rt > 0$

9.

Quantity A	*Quantity B*
$\frac{3}{r} + \frac{4}{t}$	$\frac{3t+4r}{rt}$



10.

Quantity A	*Quantity B*
$z - x$	y

Questions 11 to 25 have several different formats. Unless otherwise directed, select a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Questions

Enter your answer in the answer boxes below the question.

- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a question asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

11. $\frac{9^2 - 6^2}{3} =$

(A) 1

(B) $\frac{15}{9}$

(C) 5

(D) 8

(E) 15

12. What is 0.423658 rounded to the nearest thousandth?

(A) 0.42

(B) 0.423

(C) 0.424

(D) 0.4236

(E) 0.4237

13. If $3(x + 2) = x - 4$, then $x =$

(A) -5

(B) -3

(C) 1

(D) 3

(E) 5

14. If $x^2 + 2xy + y^2 = 9$, then $(x + y)^4 =$

(A) 3

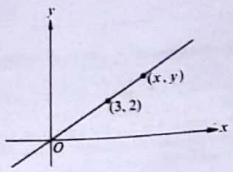
(B) 18

(C) 27

(D) 36

(E) 81

For the following question, enter your answer in the box.



15. In the rectangular coordinate system above, if $x = 4.8$, then $y =$

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16. If x is the number on the number line between 5 and 15 that is twice as far from 5 as from 15, then x is

(A) $5\frac{2}{3}$

(B) 10

(C) $11\frac{2}{3}$

(D) $12\frac{1}{3}$

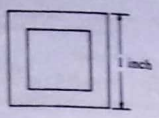
(E) $13\frac{1}{2}$

17. Jane has exactly 3 times as many Canadian as non-Canadian stamps in her collection. Which of the following CANNOT be the number of stamps in Jane's collection?

(A) 96
(B) 80
(C) 72
(D) 68
(E) 54

For the following question, enter your answer in the box.

18. A distillate flows into an empty 64-gallon drum at spout A and out of the drum at spout B. If the rate of flow through A is 2 gallons per hour, how many gallons per hour must flow out at spout B so that the drum is full in exactly 96 hours?



19. In the figure above, if the area of the smaller square region is $\frac{1}{2}$ the area of the larger square region, then the diagonal of the larger square is how many inches longer than the diagonal of the smaller square?

(A) $\sqrt{2}-1$
(B) $\frac{1}{2}$
(C) $\frac{\sqrt{2}}{2}$
(D) $\frac{\sqrt{2}+1}{2}$
(E) $\sqrt{2}$

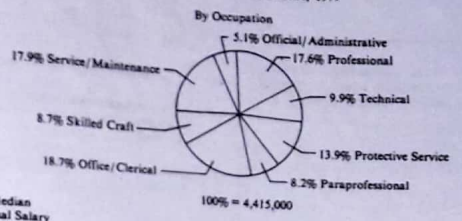
20. A farmer has two rectangular fields. The larger field has twice the length and 4 times the width of the smaller field. If the smaller field has area K, then the area of the larger field is greater than the area of the smaller field by what amount?

(A) $2K$
(B) $6K$
(C) $7K$
(D) $8K$
(E) $12K$

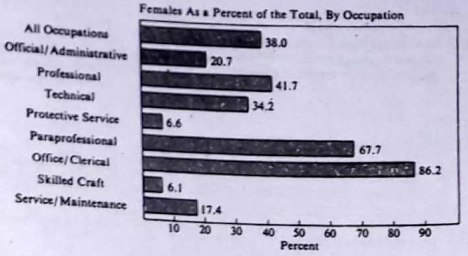
Questions 21-25 refer to the following graphs

DATA INTERPRETATION PRACTICE SET 8

STATE AND LOCAL GOVERNMENT EMPLOYMENT AND SALARY, BY OCCUPATION AND SEX, 1977



Median Annual Salary	
Male	Female
$12,390	$ 9,093
18,723	14,066
15,740	12,650
12,885	9,445
13,622	9,827
9,054	7,761
9,723	8,456
11,657	8,892
9,547	7,307



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1. Approximately what percent of state and local government employees were male?

(A) 38%
(B) 52%
(C) 58%
(D) 62%
(E) 80%

22. State and local governments employed approximately how many more office/clerical employees than skilled craft employees?

(A) 384,000
(B) 441,500
(C) 650,500
(D) 825,600
(E) 1,209,700

23. For state and local government employees, the median annual salary for males was approximately what percent greater than that for females?

(A) 10%
(B) 20%
(C) 25%
(D) 35%
(E) 75%

24. For state and local government employees, approximately what was the difference between the number of females employed as professionals and the number of females employed in service / maintenance occupations?

(A) 75,000
(B) 185,000
(C) 765,000
(D) 1,070,000
(E) 1,840,000

25. Which of the following statements about state and local government employees can be inferred from the data?

I. Fewer than of those in paraprofessional occupations were males.

II. There were more than 5 times the number of females in the technical occupations as in the skilled craft occupations.

III. There were more than 6 times the number of females in the professional occupations as in the official / administrative occupations.

(A) I only
(B) II only
(C) I and II only
(D) II and III only
(E) I, II, and III

GRE QUANTITATIVE SECTIONAL TEST

TEST 14

Time : 40 Minutes
25 Questions

For each question, indicate the best answer, using the directions given.

Notes: All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated. Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not** necessarily drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

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Graphical data presentations, such as bar graphs, circles graphs, and line graphs, are drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 10, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

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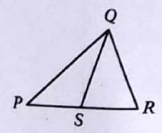
[B] **Quantity B is greater.**
[C] **The two quantities are equal.**
[D] **The relationship cannot be determined from the information given.**

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

	Quantity A	Quantity B	Correct Answer
Example 1:	(2)(6)	2+6	■ [B] [C] [D]



	Quantity A	Quantity B	Correct Answer
Example 2:	*PS*	*SR*	[A] [B] [C] ■ (since equal lengths cannot be assumed, even though *PS* and *SR* appear equal)

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Questions 11 to 25 have several different formats. Unless otherwise directed, select a single answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Questions

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- **Your answer may be an integer, a decimal, or a fraction, and it may be negative.**
- **If a quertion asks for a fraction, there will be two boxes-one for the numerator and one for the denominator.**
- **Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.**
- **Enter the exact answer unless the question asks you to round your answer**

For the following question, enter your answer in the box.

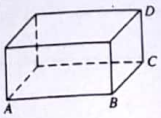
11. In a certain class, if there are 35 men and 63 women, then the ratio of men to women is

12. Streets L, M, and N are straight and level, and they intersect to form a triangle. If streets L and M intersect at a $40°$ angle and if street N is perpendicular to street M, at what acute angle do streets L and N intersect?

(A) $30°$
(B) $35°$
(C) $40°$
(D) $45°$
(E) $50°$

For the following question, enter your answer in the box.

13. $\left(1-\frac{1}{2}\right)^2\left(1-\frac{1}{3}\right)^2$



14. The figure above is a rectangular solid with $AB = 10$, $BC = 10$, and $CD = 3$. What is the total surface area of the figure?

(A) 320
(B) 300
(C) 220
(D) 160
(E) 23

15. $6x^2 - 15x - 21 =$

(A) $3(2x + 7)(x - 1)$
(B) $3(2x - 7)(x + 1)$
(C) $3(2x - 1)(x + 7)$
(D) $-9x^2 - 21$
(E) $-9x - 21$

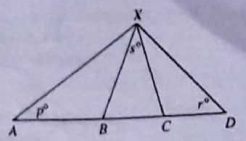
16. If n is the average (arithmetic mean) of the three numbers 6, 9, and k, what is the value of k in terms of n?

(A) $3n - 15$
(B) $n - 5$
(C) $n - 15$
(D) $\frac{n-15}{3}$
(E) $\frac{n+15}{3}$

For the following question, select all the answer choices that apply.

17. Which of the following CAN be expressed as the sum of the squares of two integers?

(A) 17
(B) 29
(C) 34



18. If $AB = BX$ and $XC = CD$ in the figure above, what is s in terms of p and r?

(A) $180 - 2(p + r)$
(B) $p + r - 90$
(C) $2(p + r)$
(D) $p + r$
(E) $\frac{p-r}{2}$

19. Mary has 3 dollars more than Bill has, but 5 dollars less than Jane has. If Mary has x dollars, how many dollars do Jane and Bill have altogether?

(A) $2x - 8$
(B) $2x - 5$
(C) $2x - 2$
(D) $2x + 2$
(E) $2x + 8$

20. If n is an integer divisible by 6 but not by 4, then which of the following CANNOT be an integer?

(A) $\frac{n}{2}$
(B) $\frac{n}{3}$
(C) $\frac{n}{6}$
(D) $\frac{n}{10}$
(E) $\frac{n}{12}$

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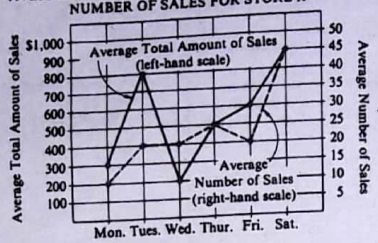
Questions 21-25 refer to the following graphs

DATA INTERPRETATION PRACTICE SET 9

AVERAGE* DAILY TOTAL AMOUNT OF SALES AND NUMBER OF SALES FOR STORE *X*



*"Average" means "arithmetic mean."

Note: Drawn to scale.

21. What is the average total amount of sues made on a Friday for Store *X*?

(A) $200 (B) $300 (C) $400
(D) $500 (E) $600

22. On the average, what is the total amount of sales per week (Monday through Saturday) for Store *X*?

(A) $2,700 (B) $2,800
(C) $3,300 (D) $3,600
(E) $4,400

23. What is the average amount of a sale made on a Wednesday for Store *X*?

(A) $0.50
(B) $2.00
(C) $10.00
(D) $20.00
(E) $40.00

24. On which of the following days is the average amount of a sale greatest for Store *X*?

(A) Monday
(B) Tuesday
(C) Wednesday
(D) Thursday
(B) Saturday

25. During the first week of a certain month, how many more sales were made in Store *X* on Saturday than on Monday?

(A) 15
(B) 25
(C) 30
(D) 35
(E) It cannot be determined from the information given.

Answer Key
Quantitative Sectional Tests

TEST 1	TEST 2	TEST 3	TEST 4
1. D	1 B	1 B	1 B
2 C	2 A	2 C	2 B
3 B	3 C	3 D	3 C
4 C	4 A	4 B	4 D
5 D	5 B	5 B	5 A
6 C	6 C	6 A	6 A
7 B	7 B	7 C	7 B
8 C	8 B	8 C	8 C
9 D	9 A	9 A	9 C
10 A	10 C	10 A	10 C
11 B	11 D	11 B	11 D
12 D	12)	12 D	12 D
13 $\frac{2}{15}$	13 B	13 B	13 A
14 E	14 E	14 C	14 D
15 D	15 D	15 C	15 D
16 E	16 C	16 30	16 E
17 B	17 D	17 D	17 $\frac{1}{2}$
18 C	18 B	18 B	18 C
19 A	19 E	19 C	19 A
20 B	20 D	20 D	20 D
21 A	21 D	21 D	21 B
22 E	22 114	22 C	22 $3,000
23 C	23 C	23 B	23 C
24 D	24 E	24 57	24 B
25 D	25 A	25 A	25 D

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Answer Key
Quantitative Sectional Tests

TEST 5	TEST 6	TEST 7	TEST 8
1 D	1 B	1. A	1. C
2 B	2 B	2. A	2. B
3 B	3 D	3. C	3. B
4 C	4 D	4. D	4. D
5 A	5 B	5. C	5. A
6 B	6 B	6. D	6. D
7 C	7 A	7. D	7. C
8 D	8. A	8. A	8. B
9. D	9. C	9. C	9. B
10 A	10. C	10. B	10. B
11 A	11. C	11. C	11. C, E
12 B	12. D	12. B	12. E
13 D	13. D	13. A, B, C, E	13. A
14 E	14. $40	14. D	14. C
15 45%	15. A, E	15. D	15. E
16 B	16. B	16. C	16. D
17 D	17. C	17. A,B	17. B
18 B	18. A, B, D, E	18. E	18. D
19 E	19. E	19. B	19. B
20 A	20. D	20. C	20. A
21. 1985	21. D	21. 900°	21. B, C
22 B	22. B	22. 25	22. A, D
23 E	23. 150,000	23. B	23. A, C, D
24 E	24. E	24. B	24. 5,000
25 C	25. D	25. A	25. 28%

Answer Key
Quantitative Sectional Tests

TEST 9	TEST 10	TEST 11	TEST 12
1. C	1 B	1. A	1. A
2. A	2 C	2. C	2. B
3. B	3 C	3. B	3. A
4. B	4 A	4. D	4. D
5. D	5 C	5. C	5. A
6. A	6 C	6. D	6. C
7. B	7 C	7. B	7. B
8. B	8 A	8. B	8. D
9. A, C, E	9 B	9. D	9. B
10. A, C, D	10 A, C	10. A	10. C
11. D	11 E	11. E	11. D
12. B	12 D	12. 12	12. D
13. B	13 A	13. D	13. C
14. 12.5	14 A, E	14. A	14. B
15. A, B	15 D	15. C	15. D
16. A	16 E	16. D	16. C
17. B	17 C	17. E	17. A
18. C	18 A	18. A	18. $108,000
19. A	19 $\frac{1}{221}$, or any fraction that reduces to this	19. E	19. E
20. C		20. 3	20. E
21. D	20 E	21. B	21. C
22. C	21 A	22. D	22. C
23. C	22. C	23. C	23. A
24. 392	23 B	24 E	24 B
25. D	24 A	25. A	25. E
	25 C		

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Answer Key
Quantitative Sectional Tests

TEST 13	TEST 14
1. B	1. A
2. B	2. A
3. D	3. B
4. A	4. A
5. B	5. C
6. C	6. B
7. D	7. D
8. A	8. D
9. D	9. A
10. C	10. B
11. E	11. $\frac{5}{9}$
12. C	12. E
13. A	13. $\frac{1}{9}$
14. E	14. A
15. 3.2	15. B
16. C	16. A
17. E	17. A, C
18. $\frac{4}{3}$	18. A
19. A	19. D
20. C	20. E
21. D	21. E
22. B	22. C
23. D	23. C
24. B	24. B
25. E	25. E

GRE POST CLASS STUDY PLAN

DAY 1	VERBAL (Day 1 – 10)		MATHS (Day 1 – 20)
DAY 2	• Solve all the questions of Book 1, OG and VR completely according to the PROCESS taught in your classes.		• You are expected to start & finish the following in the TOPIC WISE MANNER o Revise THE COMPLETE Theory + Solved Examples - Jamboree Quantitative review (in GRE Book 1) o RE-DO ALL the CLASS HANDOUT / FORMULA sheet for that topic from in GRE Book 1 o RE-DO ALL related questions from topic wise questions from GRE Book 1. (Please make sure to do all the questions from the topic wise questions from book 1 if you have not done them during the classes) • Must DO ALL related questions from the ADVANCED PRACTICE CONTENT from GRE Book 2.
DAY 3	• Revise all the tips for SC CR and RC thoroughly		
DAY 4	• Revise all the Key Indicators		
DAY 5	• Make sure you can recollect and understand the methodology used in solving the questions		
DAY 6	• Practice your Vocab Lists.		
DAY 7	• AWA : Start writing from the pool of topics from www.ets.org/gre /awtopics and email them to your Faculty to get them scored.		
DAY 8			
DAY 9			
DAY 10			
DAY 11	VERBAL (Day 11–25)	FULL LENGTH TESTS (Day 11–25)	
DAY 12	-50% of Book 2 (In sync with webinars)	DAY 16: Kaplan Sectional tests (2 Verbal + 3 Maths)	
DAY 13			
DAY 14			
DAY 15	-Get Jamboree Online account activated	DAY 18: Kaplan Sectional tests (2 Verbal + 3 Maths)	
DAY 16			
DAY 17	-Complete Jamboree Sectional tests	DAY 20: Kaplan Sectional tests (3 Verbal + 2 Maths)	
DAY 18			
DAY 19		DAY 22: Kaplan Sectional tests (3 Verbal + 3 Maths)	
DAY 20	-Revise Vocab Lists	DAY 23: ETS QR Practice Test 1	
DAY 21			
DAY 22		DAY 24: ETS QR Practice Test 2	
DAY 23		DAY 25: ETS QR Practice Test 3 + Verbal Test 1 in Book 2	
DAY 24			
DAY 25			

Attend Book 2 webinars for both Maths and Verbal

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