RAVI MATHS TUITION CENTER , WHATSAPP - 8056206308

MCQ

10th Standard

Maths

300 x 1 = 300

1) If n(A x B) = 6 and A = {1,3} then n(B) is

(a) 1 (b) 2 (c) 3 (d) 6

2) A = {a,b,p}, B = {2,3}, C = {p,q,r,s} then n[(A U C) x B] is

(a) 8 (b) 20 (c) 12 (d) 16

3) If A = {1, 2}, B = {1, 2, 3, 4}, C = {5, 6} and D = {5, 6, 7, 8} then state which of the following statement is true..

(a) (A x C) ⊂ (B x D) (b) (B x D) ⊂ (A x C) (c) (A x B) ⊂ (A x D)

(d) (D x A) ⊂ (B x A)

4) If there are 1024 relations from a set A = {1, 2, 3, 4, 5} to a set B, then the number of elements in B is

(a) 3 (b) 2 (c) 4 (d) 8

5) The range of the relation R = {(x, x^2) | x is a prime number less than 13} is

(a) {2,3,5,7} (b) {2,3,5,7,11} (c) {4,9,25,49,121} (d) {1,4,9,25,49,121}

6) If the ordered pairs (a + 2, 4) and (5, 2a + b) are equal then (a,b) is

(a) (2,-2) (b) (5,1) (c) (2,) (d) (3,-2)

7) Let n(A) = m and n(B) = n then the total number of non-empty relations that can be defined from A to B is

(a) m^n (b) n^m (c) $2^{mn}-1$ (d) 2^{mn}

8) If {(a, 8),(6, b)}represents an identity function, then the value of a and b are respectively

(a) (8,6) (b) (8,8) (c) (6,8) (d) (6,6)

9) Let A = {1, 2, 3, 4} and B = {4, 8, 9, 10}. A function f: A ⟶ B given by f = {(1, 4), (2, 8), (3, 9), (4,10)} is a

(a) Many-one function (b) Identity function (c) One-to-one function

(d) Into function

10) If f(x) = $2x^2$ and g(x) = $\frac{1}{3x}$, then f o g is

(a) $\frac{3}{2x^2}$ (b) $\frac{2}{3x^2}$ (c) $\frac{2}{9x^2}$ (d) $\frac{1}{6x^2}$

11) If f: A ⟶ B is a bijective function and if n(B) = 7,then n(A) is equal to

(a) 7 (b) 49 (c) 1 (d) 14

12) Let f and g be two functions given by
f = {(0,1), (2,0), (3,-4), (4,2), (5,7)}
g = {(0,2), (1,0), (2,4), (-4,2), (7,0)} then the range of f o g is

(a) {0,2,3,4,5} (b) {–4,1,0,2,7} (c) {1,2,3,4,5} (d) {0,1,2}

13) Let f(x) = $\sqrt{1+x^2}$ then

(a) f(xy) = f(x).f(y) (b) f(xy) ≥ f(x).f(y) (c) f(xy) ≤ f(x).f(y) (d) None of these

14) If g = {(1,1), (2,3), (3,5), (4,7)} is a function givrn by g(x) = αx + β then the values of α and β are

(a) (-1,2) (b) (2,-1) (c) (-1,-2) (d) (1,2)

15) f(x) = $(x + 1)^3 - (x - 1)^3$ represents a function which is

(a) linear (b) cubic (c) reciprocal (d) quadratic

16) If f : R⟶R is defined by (x) = $x^2 + 2$, then the premiage 27 are:

(a) 0.5 (b) 5,-5 (c) 5.0 (d) $\sqrt{5}, -\sqrt{5}$

17) $(x - \frac{1}{x}) = x^2 + \frac{1}{x^2}$ then f(x) =

(a) $x^2 + 2$ (b) $x^2 + \frac{1}{x^2}$ (c) $x^2 - 2$ (d) $x^2 - \frac{1}{x^2}$

18) A = {a,b,C},B = {2,3},C = {a,b,c,d} then n[(A ∩ C) x B] is:

(a) 6 (b) 8 (c) 4 (d) 12

19) If the order pairs (a,-1) and 5,b) blongs to {(x,y) [y = 2x + 3}, then a and b are:

(a) -13,2 (b) 2,13 (c) 2,-13 (d) -2,13

20) If function f : N⟶N, f(x) = 2x then the function is, then the function is

(a) Not one - one and not onto (b) one-one and onto

(c) Not one -one but not onto (d) one - one but not onto

21) If f(x) = x + 1 then f(f(f(y + 2)) is :

(a) y + 5 (b) y + 6 (c) y + 7 (d) y + 9

22) If f(x) = mx + n,when m and n are integers f(-2) = 7, and f(3) = 2 then m and n are equal to :

(a) -1,-5 (b) 1,-9 (c) -1,5 (d) 1,9

23) If f(x) = ax - 2,g(x) = 2x - 1 and fog = gof, the value of a is

(a) 3 (b) -3 (c) $\frac{1}{3}$ (d) 13

24) If $f(x) = \frac{1}{x}$, and $g(x) = \frac{1}{x^3}$ then f o g o(y),is:

(a) $\frac{1}{y^8}$ (b) $\frac{1}{y^6}$ (c) $\frac{1}{y^4}$ (d) $\frac{1}{y^3}$

25) If f(x) + f(1 - x) = 2 then $f\left(\frac{1}{2}\right)$ is

(a) 5 (b) -1 (c) -9 (d) 1

26) If f is identify function, then the value of f(1) - 2f(2) + f(3) is:

(a) -1 (b) -3 (c) 1 (d) 0

27) Composition of functions is commutative

(a) Always true (b) Never true (c) Sometimes true

28) Composition of functions is associative

(a) Always true (b) Never true (c) Sometimes true

29) Euclid's division lemma states that for positive integers a and b, there exist unique integers q and r such that a = bq + r , where r must satisfy

(a) $1 < r < b$ (b) $0 < r < b$ (c) $0 \leq r < b$ (d) $0 < r \leq b$

30) Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are

(a) 0, 1, 8 (b) 1, 4, 8 (c) 0, 1, 3 (d) 0, 1, 3

31) If the HCF of 65 and 117 is expressible in the form of 65m - 117 , then the value of m is

(a) 4 (b) 2 (c) 1 (d) 3

32) The sum of the exponents of the prime factorization of 1729 is

(a) 1 (b) 2 (c) 3 (d) 4

33) The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is

(a) 2025 (b) 5220 (c) 5025 (d) 2520

34) $7^{4k} \equiv$ _____ (mod 100)

(a) 1 (b) 2 (c) 3 (d) 4

35) Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is

(a) 3 (b) 5 (c) 8 (d) 11

36) The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A.P.

(a) 4551 (b) 10091 (c) 7881 (d) 13531

37) If 6 times of 6^{th} term of an A.P. is equal to 7 times the 7^{th} term, then the 13^{th} term of the A.P. is

(a) 0 (b) 6 (c) 7 (d) 13

38) An A.P. consists of 31 terms. If its 16th term is m, then the sum of all the terms of this A.P. is

(a) 16 m (b) 62 m (c) 31 m (d) $\frac{31}{2}$ m

39) In an A.P., the first term is 1 and the common difference is 4. How many terms of the A.P. must be taken for their sum to be equal to 120?

(a) 6 (b) 7 (c) 8 (d) 9

40) If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + ... + 2^0$ Which of the following is true?

(a) B is 2^{64} more than A (b) A and B are equal (c) B is larger than A by 1

(d) A is larger than B by 1

41) The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, ...$ is

(a) $\frac{1}{24}$ (b) $\frac{1}{27}$ (c) $\frac{2}{3}$ (d) $\frac{1}{81}$

42) If the sequence t_1, t_2, t_3...are in A.P. then the sequence t_6, t_{12}, t_{18},....is

(a) a Geometric Progression (b) an Arithmetic Progression

(c) neither an Arithmetic Progression nor a Geometric Progression

(d) a constant sequence

43) The value of $(1^3 + 2^3 + 3^3 + ...15^3) - (1 + 2 + 3 + ... + 15)$is

(a) 14400 (b) 14200 (c) 14280 (d) 14520

44) A square is drawn by joinintg the mid points of the sides of a given square in the same way and this process continues indefinitely. If the side of the first square is 4 cm, then the sum of the area of all the squares is:

(a) 8 cm^2 (b) 16 cm^2 (c) 32 cm^2 (d) 64 cm^2

45) A boy saves Rs 1 on the first day Rs 2 on the second day, Rs 4 on the third day and so on.How much did the boy will save upto 20 days?

(a) $2^{19} + 1$ (b) $2^{19} - 1$ (c) $2^{20} - 1$ (d) $2^{21} - 1$

46) The sum of first n terms of the series a, 3a, 5a...is :

(a) na (b) (2n - 1)a (c) $n^2 - a$ (d) n^2a^2

47) If p, q, r, x, y, z are in A.P, then 5p + 3,5r + 3,5x + 3,5y + 3,5z + 3 form

(a) a G.P (b) an A.P (c) a constant sequence

(d) neither an A.P nor a G.P

48) Euclid's division lemma cail be used to find the _____ of any two positive integers

(a) HCF (b) Multiples (c) Both (d) None of these

49) Euclid's division lemma is not applicable for which values of b?

(a) Positive integer (b) Zero (c) Negative integer (d) All of these

50) Using Euclid's division lemma HCF of 455 and 42 canbe expressed as_____

(a) 455 = 42 x 9 + 77 (b) 455 = 42 x 10 + 35 (c) 455 = 42 x 11 - 7

(d) 455 = 42 x 12 - 49

51) If 1 + 2+ 3 + . . . + 10 = 55, then, $1^3 + 2^3 + 3^3 + \ldots\ldots 10^3$ = ?

(a) 55^2 (b) 10^2 (c) 55^3 (d) 10^3

52) $1^2 + 2^2 + 3^2 \ldots\ldots + n^2$ = ?

(a) $\left[\frac{n(n+1)}{2}\right]^2$ (b) $\frac{n(n+1)}{2}$ (c) n^2 (d) $\frac{n(n+1)(2n+1)}{6}$

53) If 2 + 4 + 6 + ... 2k = 90, then the value of k is

(a) 8 (b) 9 (c) 10 (d) 11

54) The Value of r_1 such that $1 + r + r^2 + r^3 + \ldots\ldots\ldots\ldots\ldots = 3/4$

(a) 1/3 (b) -1/3 (c) 3 (d) -3

55) A system of three linear equations in three variables is inconsistent if their planes

(a) intersect only at a point (b) intersect in a line

(c) coincides with each other (d) do not intersect

56) The solution of the system x + y − 3x = −6, −7y + 7z = 7 , 3z = 9 is

(a) x = 1, y = 2, z = 3 (b) x = −1, y = 2, z = 3 (c) x = −1, y = −2, z = 3

(d) x = 1, y = 2, z = 3

57) If (x - 6) is the HCF of x^2 - 2x - 24 and x^2 - kx - 6 then the value of k is

(a) 3 (b) 5 (c) 6 (d) 8

58) $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is

(a) $\frac{9y}{7}$ (b) $\frac{9y^2}{(21y-21)}$ (c) $\frac{21y^2-42y+21}{3y^2}$ (d) $\frac{7(y^2-2y+1)}{y^2}$

59) $y^2 + \frac{1}{y^2}$ is not equal to

(a) $\frac{y^2+1}{y^2}$ (b) $\left(y+\frac{1}{y}\right)^2$ (c) $\left(y-\frac{1}{y}\right)^2+2$ (d) $\left(y+\frac{1}{y}\right)^2-2$

60) $\frac{x}{x^2-25} - \frac{8}{x^2+6x+5}$ gives

(a) $\frac{x^2-7x+40}{(x-5)(x+5)}$ (b) $\frac{x^2+7x+40}{(x-5)(x+5)(x+1)}$ (c) $\frac{x^2-7x+40}{(x^2-25)(x+1)}$ (d) $\frac{x^2+10}{(x^2-25)(x+1)}$

61) The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to

(a) $\frac{16}{5}\left|\frac{x^2z^4}{y^2}\right|$ (b) $16\left|\frac{y^2}{x^2z^2}\right|$ (c) $\frac{16}{5}\left|\frac{y}{xz^2}\right|$ (d) $\frac{16}{5}\left|\frac{xz^2}{y}\right|$

62) Which of the following should be added to make $x^4 + 64$ a perfect square

(a) $4x^2$ (b) $16x^2$ (c) $8x^2$ (d) $-8x^2$

63) The solution of $(2x - 1)^2 = 9$ is equal to

(a) -1 (b) 2 (c) -1, 2 (d) None of these

64) The values of a and b if $4x^4 - 24x^3 + 76x^2 + ax + b$ is a perfect square are

(a) 100, 120 (b) 10, 12 (c) -120, 100 (d) 12, 10

65) If the roots of the equation $q^2x^2 + p^2x + r^2 = 0$ are the squares of the roots of the equation $qx^2 + px + r = 0$, then q, p, r are in _____.

(a) A.P (b) G.P (c) Both A.P and G.P (d) none of these

66) Graph of a linear polynomial is a _____

(a) straight line (b) circle (c) parabola (d) hyperbola

67) The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the X axis is

(a) 0 (b) 1 (c) 0 or 1 (d) 2

68) For the given matrix $A = \begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{pmatrix}$ the order of the matrix A^T is

(a) 2 x 3 (b) 3 x 2 (c) 3 x 4 (d) 4 x 3

69) If A is a 2 x 3 matrix and B is a 3 x 4 matrix, how many columns does AB have

(a) 3 (b) 4 (c) 2 (d) 5

70) If number of columns and rows are not equal in a matrix then it is said to be a

(a) diagonal matrix (b) rectangular matrix (c) square matrix

(d) identity matrix

71) Transpose of a column matrix is

(a) unit matrix (b) diagonal matrix (c) column matrix (d) row matrix

72) Find the matrix X if $2X + \begin{pmatrix} 1 & 3 \\ 5 & 7 \end{pmatrix} = \begin{pmatrix} 5 & 7 \\ 9 & 5 \end{pmatrix}$

(a) $\begin{pmatrix} -2 & -2 \\ 2 & -1 \end{pmatrix}$ (b) $\begin{pmatrix} 2 & 2 \\ 2 & -1 \end{pmatrix}$ (c) $\begin{pmatrix} 1 & 2 \\ 2 & 2 \end{pmatrix}$ (d) $\begin{pmatrix} 2 & 1 \\ 2 & 2 \end{pmatrix}$

73) Which of the following can be calculated from the given matrices A = $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$, B = $\begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$,

(i) A^2

(ii) B^2

(iii) AB

(iv) BA

(a) (i) and (ii) only (b) (ii) and (iii) only (c) (ii) and (iv) only

(d) all of these

74) If A = $\begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$, B = $\begin{pmatrix} 1 & 0 \\ 2 & -1 \\ 0 & 2 \end{pmatrix}$ and C = $\begin{pmatrix} 0 & 1 \\ -2 & 5 \end{pmatrix}$, Which of the following statements are correct?

(i) AB + C = $\begin{pmatrix} 5 & 5 \\ 5 & 5 \end{pmatrix}$

(ii) BC = $\begin{pmatrix} 0 & 1 \\ 2 & -3 \\ -4 & 10 \end{pmatrix}$

(iii) BA + C = $\begin{pmatrix} 2 & 5 \\ 3 & 0 \end{pmatrix}$

(iv) (AB)C = $\begin{pmatrix} -8 & 20 \\ -8 & 13 \end{pmatrix}$

(a) (i) and (ii) only (b) (ii) and (iii) only (c) (iii) and (iv) only

(d) all of these

75) For what set of values $\frac{x^2+5x+6}{x^2+8x+15}$ is underfined

(a) -3,-5 (b) -5 (c) -2,-3,-5 (d) -2,-3

76) $\frac{x^2+7x12}{x^2+8x+15} \times \frac{x^2+5x}{x^2+6x+8} =$ _____

(a) x+2 (b) $\frac{x}{x+2}$ (c) $\frac{35x^2+60x}{48x^2+120}$ (d) $\frac{1}{x+2}$

77) If $\frac{p}{q} = a$ then $\frac{p^2+q^2}{p^2-q^2}$

(a) $\frac{a^2+1}{a^2-1}$ (b) $\frac{1+a^2}{1-a^2}$ (c) $\frac{1-a^2}{1-+a^2}$ (d) $\frac{a^2-1}{a^2+1}$

78) The square root of $4m^2$-24m+36 is

(a) 4(m-3) (b) 2(m-3) (c) $(2m-3)^2$ (d) (m-3)

79) The real roots of the quardractic equation x^2-x-1 are

(a) 1,1 (b) -1,1 (c) $\frac{1+\sqrt{5}}{2}, \frac{1-\sqrt{5}}{2}$ (d) None

80) The solution of x^2 - 25 = 0 is

(a) no real roots (b) real and equal roots (c) real and unequal roots

(d) imafinary roots

81) The solution of the system of equations 4x + 2y - 4z = - 18, 8x - 2y - 5z = -18 and -16x - 2y - z = -2.

(a) (1 ,0,4) (b) (4,,0, 1) (c) (0, -1,-4) (d) (0, -1,4)

82) The GCD of two nrrnbers is 36 and their LCM is 648. The product of two numbers is

(a) 23328 (b) 648 (c) 3888 (d) 23348

83) The LCM of $x^2 - 3ax + 2a^2, x^2 - 4ax + 4a^2$ and $x^2 - ax - 2a^2$ is

(a) $(x-2a)^2\left(x^2-a^2\right)$ (b) $(x-a)^2(x-2a)$ (c) $(x-a)(x-2a)(x-3a)$

(d) $(x-2a)^3$

84) If a and b are two positive integers where a > 0 b is a factor of a, then HCF of a and b is

(a) b (b) a (c) 3ab (d) $\frac{a}{b}$

85) Simplified form of $\frac{x^3-3x^2}{9x^2-x^4}$ is

(a) $\frac{1}{x+3}$ (b) $-\frac{1}{x+3}$ (c) $\frac{1}{3(x+1)}$ (d) $\frac{1}{3(x-1)}$

86) Simplest form of $\frac{a^2-b^2}{a^2-3ab+2b^2}$ is

(a) $\frac{(a+b)^2}{a-2b}$ (b) $\frac{a+b}{a-2b}$ (c) $\frac{a-b}{a-2b}$ (d) $\frac{a+b}{a+2b}$

87) If the discriminant of $3x^2$ - 14 x + k = 0 is 100, then k =

(a) 8 (b) 32 (c) 16 (d) 24

88) The roots of the equation $4x^2 - 2x + 8 = 0$ are

(a) Real and equal (b) Rational and not equal (c) Irrational (d) Not real

89) The Discriminant of $\sqrt{x^2 + x + 1} = 2$ is

(a) -3 (b) 13 (c) 11 (d) 12

90) If a and b are the roots of the equation $x^2 - 6x + 6 = 0$, then the value of $a^2 + b^2$ is

(a) 36 (b) 24 (c) 12 (d) 6

91) The roots of the equation $x^2 + kx + 12 = 0$ will differ by unity only when

(a) $k = \pm\sqrt{12}$ (b) $k = \pm\sqrt{48}$ (c) $k = \pm\sqrt{47}$ (d) $k = \pm\sqrt{49}$

92) Ajay and Vijay Solved an equatioa. In solving it Ajay made a mistake in the constant term only and got the roots as 8 and 2, while Vijay made a mistake in thc coefficient of x only and obtained the roots as - 9 and - 1. The correct roots of the equation are

(a) 8, -1 (b) -9, 2 (c) -8, -2 (d) 9, 1

93) If $\mathbf{A}\begin{bmatrix} 3 & -3 \\ -3 & 3 \end{bmatrix}$ and $\mathbf{A}^2 = \mathbf{kA}$, then $\mathbf{k} =$

(a) 4 (b) 5 (c) 6 (d) 7

94) If $\mathbf{A} + \mathbf{B} = \begin{bmatrix} 10 & 8 \\ 8 & 4 \end{bmatrix}$ and $\mathbf{A} - \mathbf{B} = \begin{bmatrix} 2 & -4 \\ 0 & 6 \end{bmatrix}$, then A =

(a) $\begin{bmatrix} 6 & 2 \\ 4 & 5 \end{bmatrix}$ (b) $\begin{bmatrix} 6 & 2 \\ 4 & 6 \end{bmatrix}$ (c) $\begin{bmatrix} 4 & 6 \\ 4 & -1 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & 3 \\ 4 & 5 \end{bmatrix}$

95) Number of matrices obtained with 36 elements is

(a) 10 (b) 9 (c) 8 (d) 7

96) If $\mathbf{A} = \begin{bmatrix} 2 & 0 \\ 0 & 1 \end{bmatrix}$ and $f(\mathbf{x}) = \mathbf{x}^2 - 5\mathbf{x} + 4\mathbf{I}$, then $f(\mathbf{A}) =$

(a) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (c) $\begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$ (d) $\begin{bmatrix} -2 & 0 \\ 0 & 0 \end{bmatrix}$

97) If order of A,B,C are3 x 4, 5 x 4 and 5 x 8, then the order of (AB^TC) is

(a) 8 x 3 (b) 3 x 8 (c) 3 x 4 (d) 4 x 5

98) Given $\mathbf{A} = \begin{bmatrix} -1 & 0 \\ 0 & 2 \end{bmatrix}$, then $\mathbf{A}^3 - \mathbf{A}^2 =$

(a) 2A (b) 2I (c) A (d) I

99) If AB = A, BA = B then $A^2 + B^2$ =

(a) A + B (b) A - B (c) AB (d) 0

100) If $ax^2 + bx + c = 0$ has equal roots, then C is equal _____.

(a) $\frac{b^2}{2a}$ (b) $\frac{b^2}{4a}$ (c) $\frac{-b^2}{2a}$ (d) $\frac{-b^2}{4a}$

101) If in triangles ABC and EDF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when

(a) $\angle B = \angle E$ (b) $\angle A = \angle D$ (c) $\angle B = \angle D$ (d) $\angle A = \angle F$

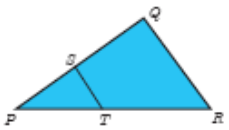
102) In $\angle$LMN, $\angle$L = 60°,$\angle$M = 50° If $\triangle$LMN ~ $\triangle$PQR then the value of $\angle$R is

(a) 40° (b) 70° (c) 30° (d) 110°

103) If $\triangle$ABC is an isosceles triangle with $\angle$C = 90° and AC = 5 cm, then AB is

(a) 2.5 cm (b) 5 cm (c) 10 cm (d) $5\sqrt{2}$cm

104) In a given figure ST || QR,PS = 2cm and SQ = 3 cm. Then the ratio of the area of $\triangle$PQR to the area $\triangle$PST is



(a) 25 : 4 (b) 25 : 7 (c) 25 : 11 (d) 25 : 13

105) The perimeters of two similar triangles$\triangle$ABC and $\triangle$PQR are 36 cm and 24 cm respectively. If PQ = 10 cm, then the length of AB is

(a) $6\frac{2}{3}$ (b) $\frac{10\sqrt{6}}{3}cm$ (c) $60\frac{2}{3}cm$ (d) 15cm

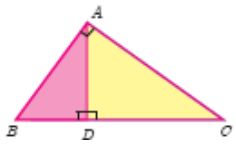
106) if $\triangle$ABC, DE || BC, AB = 3.6cm, AC = 2.4 cm and AD = 2.1 cm then the length of AE is

(a) 1.4 cm (b) 1.8 cm (c) 1.2 cm (d) 1.05 cm

107) In a $\triangle$ABC, AD is the bisector $\angle$BAC. If AB = 5cm and DC = 8cm. The length of the side AC is

(a) 6 cm (b) 4 cm (c) 3 cm (d) 8 cm

108) In the adjacent figure $\angle BAC$ = 90° and AD$\perp$BC then

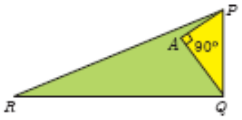


(a) BD-CD = BC^2 (b) AB.AC = BC^2 (c) BD.CD = AD^2 (d) AB-AC = AD^3

109) Two poles of heights 6 m and 11 m stand vertically on a plane ground. If the distance between their feet is 12 m, what is the distance between their tops?

(a) 13 m (b) 14 m (c) 15 m (d) 12.8 m

110) In the given figure PR = 26 cm, QR = 24cm, $\angle PAQ$ =90°, PA = 6cm and QA = 8 cm Find ∠PQR



(a) 80° (b) 85° (c) 75° (d) 90°

111) A tangent is perpendicular to the radius at the

(a) centre (b) point of contact (c) infinity (d) chord

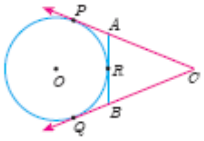
112) How many tangents can be drawn to the circle from an exterior point?

(a) one (b) two (c) infinite (d) zero

113) The two tangents from an external points P to a circle with centre at O are PA and PB.If $\angle APB$ = 70° then the value of $\angle AOB$ is

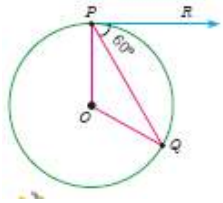
(a) 100° (b) 110° (c) 120° (d) 130°

114) In figure CP and CQ are tangents to a circle with centre at O. ARB is another tangent touching the circle at R. If CP = 11 cm and BC = 7 cm, then the length of BR is



(a) 6 cm (b) 5 cm (c) 8 cm (d) 4 cm

115) In figure if PR is tangent to the circle at P and O is the centre of the circle, then $\angle PQR$ is



(a) 120° (b) 100° (c) 110° (d) 90°

116) In a triangle, the internal bisector of an angle bisects the opposite side. Find the nature of the triangle.

(a) right angle (b) equilateral (c) scalene (d) isosceles

117) The height of an equilateral triangle of side a is

(a) $\frac{a}{2}cm$ (b) $\sqrt{3a}$ (c) $\frac{\sqrt{3}}{2}a$ (d) $\frac{\sqrt{3}}{4}a$

118) The perimeter of a right triangle is 36 cm. Its hypotenuse is 15 cm, then the area of the traiangle is

(a) $108cm^2$ (b) $54cm^2$ (c) $27cm^2$ (d) $216cm^2$

119) If the angle between two radil of a circle is °, the angle between the tangents at the end of the radii is

(a) 50^o (b) 90^o (c) 40^o (d) 70^o

120) In figure $\angle OAB = 60^o$ and OA = 6cm then radius of the circle is

(a) $\frac{3}{2}\sqrt{3}cm$ (b) 2 cm (c) $3\sqrt{3}cm$ (d) $2\sqrt{3}cm$

121) In the given figure if OC = 9 cm and OB = 15 cm then OB + BD is equal to

(a) 23 cm (b) 24 cm (c) 27 cm (d) 30 cm

122) The length of the hypotenuse of an isosceles right triangle whose one side is $4\sqrt{2}$ cm is

(a) 12 cm (b) 8 cm (c) $8\sqrt{2}$ cm (d) $12\sqrt{2}$ cm

123) A man goes 24 m due west and then 7 m due north. How are is he from the starting point?

(a) 31 m (b) 17 m (c) 25 m (d) 26 m

124) lfi an isosceles triangle $\triangle ABC$ if $AC = BC$ and $AB^2 = 2AC^2$, then $\angle C =$ _____

(a) 30^o (b) 45^o (c) 90^o (d) 60^o

125) ΔABC is an isosceles triangle in with $\angle C = 90^o$, If AC = 6cm, then AB = _____

(a) $6\sqrt{2}$ cm (b) 6 cm (c) $2\sqrt{6}$ cm (d) $4\sqrt{2}$

126) lf TP and TQ are two tangents to a circle with centre ' O ' so that $\angle POQ = 110°$, then $\angle PTQ$ is

(a) 60^o (b) 70^o (c) 80^o (d) 90^o

127) The height of an equilateral triangle whose side a units is

(a) $\frac{a}{2}$ (b) $\sqrt{2}a$ (c) $\frac{\sqrt{3}}{2}a$ (d) $\frac{\sqrt{3}}{4}a$

128) The perimeter of a right triangle is 40 cm. Its hypotenuse is 15 cm, then the area of the triangle is

(a) 100 cm^2 (b) 200 cm^2 (c) 160 cm^2 (d) 225 cm^2

129) The area of triangle formed by the points (−5, 0), (0, −5) and (5, 0) is

(a) 0 sq.units (b) 25 sq.units (c) 5 sq.units (d) none of these

130) A man walks near a wall, such that the distance between him and the wall is 10 units. Consider the wall to be the Y axis. The path travelled by the man

is

(a) x = 10 (b) y = 10 (c) x = 0 (d) y = 0

131) The straight line given by the equation x = 11 is

(a) parallel to X axis (b) parallel to Y axis (c) passing through the origin

(d) passing through the point (0,11)

132) If (5, 7), (3, p) and (6, 6) are collinear, then the value of p is

(a) 3 (b) 6 (c) 9 (d) 12

133) The point of intersection of 3x − y = 4 and x + y = 8 is

(a) (5, 3) (b) (2, 4) (c) (3, 5) (d) (4, 4)

134) The slope of the line joining (12, 3) , (4, a) is $\frac{1}{8}$.The value of 'a' is

(a) 1 (b) 4 (c) -5 (d) 2

135) The slope of the line which is perpendicular to line joining the points (0 , 0) and (– 8 , 8) is

(a) –1 (b) 1 (c) $\frac{1}{3}$ (d) -8

136) If slope of the line PQ is $\frac{1}{\sqrt{3}}$ then the slope of the perpendicular bisector of PQ is

(a) $\sqrt{3}$ (b) $-\sqrt{3}$ (c) $\frac{1}{\sqrt{3}}$ (d) 0

137) If A is a point on the Y axis whose ordinate is 8 and B is a point on the X axis whose abscissae is 5 then the equation of the line AB is

(a) 8x + 5y = 40 (b) 8x - 5y = 40 (c) x = 8 (d) y = 5

138) The equation of a line passing through the origin and perpendicular to the line 7x - 3y + 4 = 0 is

(a) 7x - 3y + 4 = 0 (b) 3x - 7y + 4 = 0 (c) 3x + 7y = 0 (d) 7x - 3y = 0

139) Consider four straight lines

(i) l_1 : 3y = 4x + 5

(ii) l_2 : 4y = 3x - 1

(iii) l_3 : 4y + 3x =7

(iv) l_4 : 4x + 3y = 2

Which of the following statement is true?

(a) l_1 and l_2 are perpendicular (b) l_1 and l_4 are parallel

(c) l_2 and l_4 are perpendicular (d) l_2 and l_3 are parallel

140) A straight line has equation 8y = 4x + 21. Which of the following is true

(a) The slope is 0.5 and the y intercept is 2.6

(b) The slope is 5 and the y intercept is 1.6

(c) The slope is 0.5 and the y intercept is 1.6

(d) The slope is 5 and the y intercept is 2.6

141) When proving that a quadrilateral is a trapezium, it is necessary to show

(a) Two sides are parallel. (b) Two parallel and two non-parallel sides.

(c) Opposite sides are parallel. (d) All sides are of equal length.

142) When proving that a quadrilateral is a parallelogram by using slopes you must find

(a) The slopes of two sides (b) The slopes of two pair of opposite sides

(c) The lengths of all sides (d) Both the lengths and slopes of two sides

143) (2, 1) is the point of intersection of two lines.

(a) x - y - 3 = 0; 3 x - y - 7 = 0 (b) x + y = 3; 3x + y =7

(c) 3x + y =3; x + y = 7 (d) x + 3y - 3 = 0; x - y - 7 = 0

144) The area of triangle formed bu the points (a,b+c),(b,c+a) and (c,a+b) is

(a) a+b+c (b) abc (c) $(a+b+c)^2$ (d) 0

145) The four vertices of a quardrilateral are (1,2),(5,-6), (7,-4) and (k,-2) taken in order. If the area of quadrilateral is zero then find the value of k.

(a) 4 (b) -2 (c) 6 (d) 3

146) Find the equation of the line passing the point whic h is parrallel to the y axis(5,3) is

(a) y=5 (b) y=3 (c) x=5 (d) x=3

147) Find the slope of the line 2y=x+8 :

(a) $\frac{1}{2}$ (b) 1 (c) 8 (d) 2

148) Find the value of P, given that the line $\frac{y}{2} = x - p$ passes through the point (-4,4) is

(a) -4 (b) -6 (c) 0 (d) 8

149) Find the slope and the y-intercept of the line $3y - \sqrt{3x} + 1 = 0$ is

(a) $\frac{1}{\sqrt{3}}, \frac{-1}{3}$ (b) $-\frac{1}{\sqrt{3}}, \frac{-1}{3}$ (c) $\sqrt{3}, 1$ (d) $-\sqrt{3}, 3$

150) Find the value of 'a' if the lines 7y = ax + 4 and 2y = 3 - x are parallel

(a) $\frac{7}{2}$ (b) $-\frac{2}{7}$ (c) $\frac{2}{7}$ (d) $-\frac{7}{2}$

151) If the area of the triangle formed by the points (- 2,3), (4, - 5) and (- 3, Y) is 10 square units, then Y =

(a) 1 (b) -1 (c) $\frac{23}{3}$ (d) $\frac{-22}{3}$

152) The area of quadrilateral formed by the points (0, 0), (1, 0), (1, 4) and (0, 2) is

(a) 4 (b) 8 (c) 12 (d) 16

153) The point (x, y) lies on the line joining (3, 4) and (-5, -6) if

(a) 4x - 5y = 1 (b) 5x - 4y = 1 (c) 5x - 4y + 1 = 0 (d) 4x + 5y = 1

154) If the points A(6, 1), B(8 , 2), C(9, 4) and D(p, 3) are the vertices of a parallelogram,taken order then the value of p is

(a) -7 (b) 7 (c) 6 (d) -6

155) What can be said regarding a line if its slope is negative?

(a) acute (b) obfuse (c) zero (d) None of these

156) What is the slope of a line whose inclination is 45º?

(a) 1 (b) 2 (c) 0 (d) $\frac{1}{2}$

157) Find the inclination whose slope is $\frac{1}{\sqrt{3}}$

(a) 30º (b) 60º (c) 90º (d) 45º

158) Slope of the line joining the points (4, - 6) and (-2, -5) is

(a) $\frac{1}{6}$ (b) $\frac{-1}{6}$ (c) 6 (d) -6

159) Equation of straight line passes through the points (0, - a) and (b, 0) is

(a) bx - ay = ab (b) ax - by = ab (c) x - y = ab (d) ax + by = 1

160) Slope of the line $\frac{x}{a} + \frac{y}{b} = 1$ is

(a) $\frac{b}{a}$ (b) $\frac{a}{b}$ (c) $\frac{-b}{a}$ (d) $\frac{-a}{b}$

161) Equation of the line perpendicular to x = 2 and passing through the point (2, - 8) is

(a) y = 8 (b) y = -8 (c) x = 8 (d) x = -2

162) Equation of straight line which cuts off intercepts 2 and 3 from the co-ordinate axes is

(a) 2x - 3y - 6 = 0 (b) 2x + 3y - 6 = 0 (c) 3x - 2y - 6 = 0

(d) 3x + 2y - 6 = 0

163) General equation of a straight line is

(a) $\frac{-a}{b} + by + \frac{c}{b} = 0$ (b) $ax^2 + by^2 + c = 0$ (c) y = mx + c

(d) ax + by + c = 0

164) The lines 3x + 4y + 7 = land 4x - 3y + 5 = 0 are

(a) Parallel (b) Perpendicular (c) Neither parallel nor perpendicular

(d) Parallel and Perpendicular

165) Equation of line perpendicular to 2x + 5y = 7 and passing through the point (- 1 , 4) is

(a) x - y +13 = 0 (b) x + y +13 = 0 (c) 2x + 5y +13 = 0

(d) 5x - 2y +13 = 0

166) Find the value of k if the staight lines (2 +6k)x,+(3 - k)y+ (4 +12k) =0 and 7x + 5y - 4 = 0 are perpendicular

(a) $\frac{29}{37}$ (b) $-\frac{29}{37}$ (c) $\frac{37}{29}$ (d) $-\frac{37}{29}$

167) The value of k if the lines 4x + ky - 8 and 4x + 3y = 5 are parallel is

(a) 3 (b) 5 (c) 4 (d) 2

168) The four vertices of a quadrilateral are (1, 2), (-5 , 6), (7 , -4), and (k, -2) taken in order. If the area of quadrilateral is zero then find the value of k

(a) -4 (b) -2 (c) 6 (d) 3

169) Find the equation of the straight line passes through the point (5, 3) which is parallel to the y-axis is

(a) y = 5 (b) y = 3 (c) x = 5 (d) x = 3

170) Find the value of p, given that the line $\frac{y}{2} = x - p$ passes through the point (-4, 4) is

(a) -4 (b) -6 (c) 0 (d) 8

171) In a right angled triangle ABC, right angled at B, if the side BC is parallel to x-axis, then the slope of AB is

(a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) 1 (d) not defined

172) The value of is $sin^2\theta + \frac{1}{1+tan^2\theta}$ equal to

(a) $tan^2\theta$ (b) 1 (c) $cot^2\theta$ (d) 0

173) tan θ cosec$^2\theta$ - tanθ is equal to

(a) secθ (b) $cot^2\theta$ (c) sinθ (d) $cot\theta$

174) if sin θ = cosθ = a and sec θ + cosec θ = b, then the value of b (a^2 - 1) is equal to

(a) 2a (b) 3a (c) 0 (d) 2ab

175) if 5x = secθ and $\frac{5}{x}$ = tanθ, then x^2 - $\frac{1}{x^2}$ is equal to

(a) 25 (b) $\frac{1}{25}$ (c) 5 (d) 1

176) if sin θ = cos θ, then 2 $\tan^2\theta$ + $\sin^2\theta$ -1 is equal to

(a) $\frac{-3}{2}$ (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) $\frac{-2}{3}$

177) if x = a tanθ and y = b secθ then

(a) $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ (b) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ (c) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ (d) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$

178) (1 + tan θ + secθ) (1 + cotθ - cosecθ) is equal to

(a) 0 (b) 1 (c) 2 (d) -1

179) a cot θ + b cosecθ = p and b cot θ + a cosecθ = q then p^2- q^2 is equal to

(a) a^2-b^2 (b) b^2-a^2 (c) a^2+b^2 (d) b-a

180) If the ratio of the height of a tower and the length of its shadow is $\sqrt{3} : 1$ then the angle of elevation of the sun has measure

(a) 45° (b) 30° (c) 90° (d) 60°

181) The electric pole subtends an angle of 30° at a point on the same level as its foot. At a second point 'b' metres above the first, the depression of the foot of the tower is 60°. The height of the tower (in metres) is equal to

(a) $\sqrt{3}$ b (b) $\frac{b}{3}$ (c) $\frac{b}{2}$ (d) $\frac{b}{\sqrt{3}}$

182) A tower is 60 m height. Its shadow is x metres shorter when the sun's altitude is 45° than when it has been 30°, then x is equal to

(a) 41.92 m (b) 43.92 m (c) 43 m (d) 45.6 m

183) The angle of depression of the top and bottom of 20 m tall building from the top of a multistoried building are 30° and 60° respectively. The height of the multistoried building and the distance between two buildings (in metres) is

(a) $20,10\sqrt{3}$ (b) $30,5\sqrt{3}$ (c) 20,10 (d) $30,10\sqrt{3}$

184) Two persons are standing 'x' metres apart from each other and the height of the first person is double that of the other. If from the middle point of the line joining their feet an observer finds the angular elevations of their tops to be complementary, then the height of the shorter person (in metres) is

(a) $\sqrt{2}$ x (b) $\frac{x}{2\sqrt{2}}$ (c) $\frac{x}{\sqrt{2}}$ (d) 2x

185) The angle of elevation of a cloud from a point h metres above a lake is β. The angle of depression of its reflection in the lake is 45°. The height of location of the cloud from the lake is

(a) $\frac{h(1+tan\beta)}{1-tan\beta}$ (b) $\frac{h(1-tan\beta)}{1+tan\beta}$ (c) h tan(45°-β) (d) none of these

186) If $(\sin \alpha + \text{cosec } \alpha)^2 + (\cos \alpha + \sec \alpha)^2 = k + \tan^2\alpha + \cot^2\alpha$, then the value of k is equal to

(a) 9 (b) 7 (c) 5 (d) 3

187) Given that $\sin\theta = \frac{a}{b}$, then $\cos\theta$ is equal to

(a) $\frac{b}{\sqrt{b^2-a^2}}$ (b) $\frac{b}{a}$ (c) $\frac{\sqrt{b^2-a^2}}{b}$ (d) $\frac{b}{\sqrt{b^2-a^2}}$

188) If cos (∝ - β) =, then sin (∝ - β) can be reduced to

(a) cos β (b) cos 2β (c) sin ∝ (d) sin 2∝

189) The value of $(\tan 1^o \tan 2^o \tan 3^o \ldots\ldots \tan 89^o)$ is

(a) 0 (b) 1 (c) 2 (d) $\frac{1}{2}$

190) If ΔABC is right angled at C, then the value of cos (A + B) is

(a) 0 (b) 1 (c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

191) If $\sin A + \sin^2 A = 1$, then the value of the expression $(\cos^2 A + \cos^4 A)$ is

(a) 1 (b) $\frac{1}{2}$ (c) 2 (d) 3

192) If secθ + tanθ = n, and secθ - tanθ = 0, then the value of mn is

(a) 2 (b) 1 (c) ±1 (d) ±2

193) The value of $\sin^2\theta + \frac{1}{1+tan^2\theta}$ of

(a) $\sin^2\theta$ (b) $\cos^2\theta$ (c) secθ (d) 1

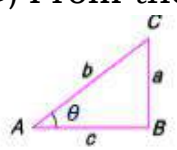
194) $(\text{cosec}^2\theta - \cot^2\theta)(1 - \cos^2\theta)$ is equal to

(a) cosec θ (b) $\cos^2\theta$ (c) $\sec^2\theta$ (d) $\sin^2\theta$

195) $9\sec^2 A - 9\tan^2 A =$

(a) 1 (b) 9 (c) 8 (d) 0

196) From the figure, the value of cosecθ+cotθ is :



(a) $\frac{a+b}{c}$ (b) $\frac{c}{a+b}$ (c) $\frac{b+c}{a}$ (d) $\frac{b}{a+c}$

197) (sec A + tanA)(1 - sinA) is equal to :

(a) sec A (b) sin A (c) cosec A (d) cos A

198) If x = rsinθ cosφ"y = rsinθ. Then $x^2 + y^2 + z^2$:

(a) r (b) r^2 (c) $\frac{r^2}{2}$ (d) $2r^2$

199) $\cos^4 A - \sin^4 A =$

(a) 2 $\cos^2$ A + 1 (b) 2 $\cos^2$ A - 1 (c) 2 $\sin^2$ A - 1 (d) 2 $\sin^2$ A + 1

200) $\frac{\sin\theta}{1+\cos\theta} =$

(a) $\frac{1+\cos\theta}{\sin\theta}$ (b) $\frac{1-\cos\theta}{\cos\theta}$ (c) $\frac{1-\cos\theta}{\sin\theta}$ (d) $\frac{1-\sin\theta}{\cos\theta}$

201) If $\sin\theta + \sin^2\theta = 1$ then $\cos^2\theta + \cos^4\theta =$

(a) -1 (b) 1 (c) 0 (d) None of these

202) From a given point when height of an object increases the angle of elevation_____

(a) increases (b) decreases (c) neither increases nor decreases

(d) equal

203) If the altitude of the sun is at 60°, then ttre height of the vertical tower that will cast a shadow of Iength 30 m is

(a) $30\sqrt{3}m$ (b) 15 m (c) $\frac{30}{\sqrt{3}}m$ (d) $15\sqrt{2}m$

204) The angle of elevation and depression are usually measured by a device called

(a) Theodolite (b) Kaleidoscope (c) Periscope (d) Telescope

205) The angle of depression of a car, standing on the ground from the top of a 75 m tower is 30° The distance of the car from the base of the tower in metres is

(a) $25\sqrt{3}$ (b) $50\sqrt{3}$ (c) $75\sqrt{3}$ (d) 150

206) A tower subtends an angle 30° at a point on the same level as its foot. At a second point h metres above ttre first the depression of the foot of the tower is 60°. The height of the tower is

(a) $\frac{h}{2}m$ (b) $\sqrt{3}$hm (c) $\frac{h}{3}m$ (d) $\frac{h}{\sqrt{3}}m$

207) The angles of depression of two ships from the top of a light house are 45° and 30° towards east. If the ships are 100 m apart, the heigt of the light house is

(a) $\frac{50}{\sqrt{3}+1}m$ (b) $\frac{50}{\sqrt{3}-1}m$ (c) $50(\sqrt{3}-1)m$ (d) $50(\sqrt{3}+1)m$

208) If the altitude of the light house is h metres and from it the angre of depression of Two ships on opposite sides of the light house are observed to be 30° and 45°, then the distance between the ships are

(a) $(\sqrt{3}+1)h$ metres (b) $(\sqrt{3}-1)h$ metres (c) $(\sqrt{3}h$ metres

(d) $1+\left(1+\frac{1}{\sqrt{3}}\right)h$ metres

209) The angle of elevation of the top of tree from a point at a distance of 250 m from its base is 60° The height of the tree is

(a) 250 m (b) $250\sqrt{3}$ m (c) $\frac{250}{\sqrt{3}}$ m (d) $200\sqrt{3}$ m

210) The angle of depression of a boat from a $50\sqrt{3}$ m high bridge is 30°. The horizontal distance of the boat from the bridge is

(a) 150 m (b) $150\sqrt{3}$ m (c) 60 m (d) $60\sqrt{3}$ m

211) A ladder of length 14 m just reaches the top of a wall. If the ladder makes an angle of 60° with the horizontal, then the height of the wall is

(a) $14\sqrt{3}$ m (b) $28\sqrt{3}$ m (c) $7\sqrt{3}$ m (d) $35\sqrt{3}$ m

212) The top of two poles of height 18.5 m and 7 m are connected by a wire. If the wire makes an angle of measure 30° with horizontal, then the length of the wire is

(a) 23 m (b) 18 m (c) 28 m (d) 25.5 m

213) The banks of a river are parallel. A swimmer starts from a point on one of the banks and swims in a straight line inclined to the bank at 45° and reaches the opposite bank at a point 20 m, from the point opposite to the starting point. The breadth of the river is equal to

(a) 12.12 m (b) 14.14 m (c) 16.16 m (d) 18.18 m

214) The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is

(a) 60π cm^2 (b) 68π cm^2 (c) 120π cm^2 (d) 136π cm^2

215) If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

(a) $4\pi r^2$ sq.units (b) $6\pi r^2$ sq.units (c) $3\pi r^2$ sq.units (d) $8\pi r^2$ sq.units

216) Th e height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be

(a) 12 cm (b) 10 cm (c) 13 cm (d) 5 cm

217) If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is

(a) 1:2 (b) 1:4 (c) 1:6 (d) 1:8

218) The total surface area of a cylinder whose radius is $\frac{1}{3}$of its height is

(a) $\frac{9\pi h^2}{8}$ sq.units (b) $24\pi h^2$ sq.units (c) $\frac{8\pi h^2}{9}$ sq.units (d) $\frac{56\pi h^2}{9}$ sq.units

219) In a hollow cylinder, the sum of the external and internal radii is 14 cm and the width is 4 cm. If its height is 20 cm, the volume of the material in it is

(a) 5600π cm^3 (b) 11200π cm^3 (c) 56π cm^3 (d) 3600π cm^3

220) If the radius of the base of a cone is tripled and the height is doubled then the volume is

(a) made 6 times (b) made 18 times (c) made 12 times (d) unchanged

221) The total surface area of a hemi-sphere is how much times the square of its radius.

(a) π (b) 4π (c) 3π (d) 2π

222) A solid sphere of radius x cm is melted and cast into a shape of a solid cone of same radius. The height of the cone is

(a) 3 x cm (b) x cm (c) 4 x cm (d) 2x cm

223) A frustum of a right circular cone is of height 16cm with radii of its ends as 8cm and 20cm. Then, the volume of the frustum is

(a) 3328π cm^3 (b) 3228π cm^3 (c) 3240π cm^3 (d) 3340π cm^3

224) A shuttle cock used for playing badminton has the shape of the combination of

(a) a cylinder and a sphere (b) a hemisphere and a cone

(c) a sphere and a cone (d) frustum of a cone and a hemisphere

225) A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r^2 units. Then r_1 r_2: is

(a) 2:1 (b) 1:2 (c) 4:1 (d) 1:4

226) The volume (in cm^3) of the greatest sphere that can be cut off from a cylindrical log of wood of base radius 1 cm and height 5 cm is

(a) $\frac{4}{3}\pi$ (b) $\frac{10}{3}\pi$ (c) 5π (d) $\frac{20}{3}\pi$

227) The height and radius of the cone of which the frustum is a part are h_1 units and r_1 units respectively. Height of the frustum is h_2 units and radius of the smaller base is r_2 units. If $h_2 : h_1 = 1:2$ then $r_2 : r_1$ is

(a) 1:3 (b) 1:2 (c) 2:1 (d) 3:1

228) The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is

(a) 1:2:3 (b) 2:1:3 (c) 1:3:2 (d) 3:1:2

229) It S_1 denotes the total surface area of a sphere of radius r and S_2 denotes the total surface area of a cylinder of base radius r and height 2r, then:

(a) $S_1=S_2$ (b) $S_1 > S_2$ (c) $S_1 > S_2$ (d) $S_1=2S_2$

230) The ratio of the volumes of two spheres is 8 : 27. If r and R are the radii of sphere respectively, Then (R - r) : r is

(a) 1:2 (b) 1:3 (c) 2:3 (d) 4:9

231) The radius of a wire is decreased to one-third of the original. If volume the same, then the length will be increased _____of the original.

(a) 3 times (b) 6 times (c) 9 times (d) 27 times

232) The height of a cone is 60cm. A small cone is cut off at the top by plane parallel to the base and its volume is $\left[\frac{1}{64}\right]^{th}$ the volume of the original cone. Then the height of the smaller cone is

(a) 45cm (b) 30cm (c) 15cm (d) 20cm

233) A solid frustum is of height 8 cm. If the radii of its lower and upper ends are 3 cm and 9 cmrespectively, then its slant height is:

(a) 15 cm (b) 12 cm (c) 10 cm (d) 17 cm

234) A solid is hemispherical at the bottom and conical above. If the curved surface areas of the two parts are equal, then the ratio of its radius and the height of its conical part is:

(a) 1:3 (b) $1:\sqrt{3}$ (c) 1:1 (d) $\sqrt{3}:1$

235) The curved surface area of a cylinder is 264 cm^2 and its volume is 924 cm^2.The ratio of diameter to its height is:

(a) 3:7 (b) 7:3 (c) 6:7 (d) 7:6

236) A cylinder having radius 1 m and height 5 m is completely filledm with milk. In how many conical flasks can this milk be filled if the radius and height is 50 cm each?

(a) 50 (b) 500 (c) 120 (d) 160

237) A floating boat having a length 3m and breadth 2 m is floating on a lake. The boat sinks by 1 cm when a man gets into it.The mass of the man is (density of water is 10000 kg/m^3)

(a) 50kg (b) 60kg (c) 70kg (d) 80kg

238) A purse contains 10 notes of Rs.2000, 15 notes of Rs.500, and 25 notes of Rs.200.One note is drawn at random. What is the probability that the note is either a Rs.500, note or Rs.200 note?

(a) $\frac{1}{5}$ (b) $\frac{3}{10}$ (c) $\frac{2}{3}$ (d) $\frac{4}{5}$

239) The lateral surface area of a cylinder is developed into a square whose diagonal is $2\sqrt{2}$ cm The area of the base of the cylinder (in cm^2) is

(a) 3π (b) $\frac{1}{\pi}$ (c) π (d) 6π

240) How many metres of cloth 2.5 m wide will be required to make a conical tent whose radius is 7 m and height is 24 m?

(a) 210 m (b) 220 m (c) 230 m (d) 240 m

241) The total surface area of a hemisphere of radius 10cm is

(a) 942.86 cm^2 (b) 900 cm^2 (c) 300 cm^2 (d) 592.86 cm2

242) The curved surface area of a right circular cone of radius 11.3 cm is 355 cm^2. What is its slant height?

(a) 8 cm (b) 9 cm (c) 10 cm (d) 11 cm

243) The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is

(a) 146 π (b) 116 π (c) 126 π (d) 136 π

244) The ratio of total surface area to the lateral surface area of a cylinder with base radius 80 cm and height 20 cm is

(a) 1 : 5 (b) 2 : 3 (c) 5 : 1 (d) 3 : 2

245) The surface arae of a sphere of diameter 'r' is

(a) $2\pi r^2$ (b) πr^2 (c) $\frac{\pi r^2}{2}$ (d) $\frac{\pi r^2}{4}$

246) The external and internal diameters of a hemispherical bowl are 10 cm and 8 cm respectively, then the volume is (cm^3)

(a) 121.87 (b) 121.78 (c) 128.71 (d) 127.81

247) If the volume and surface idea are numerically equal then its radius is

(a) 2 units (b) 3 units (c) 4 units (d) 5 units

248) If the radius of cone is reduced to half, then the new volume would be

(a) $\frac{1}{3}\left(\frac{1}{3}\pi r^2 h\right)$ (b) $\frac{1}{3}\pi\left(\frac{r}{2}\right)^2 h$ (c) $\frac{1}{3}\pi\left(\frac{r}{9}\right)^2 h$ (d) $\frac{1}{3}\pi\left(\frac{r^2}{4}\right)\left(\frac{h}{2}\right)$

249) If the volume of sphere is 36π cm^3, then its radius is equal to

(a) 3 cm (b) 2 cm (c) 5 cm (d) 10 cm

250) A cone is 8.4 cm high and radius of its base is 2.1 cm. It is melted and recast into sphere The radius of the sphere is

(a) 4.2 cm (b) 2.1 cm (c) 2.4 cm (d) 1.6 cm

251) A spherical iron ball is dropped into a vessel of base diameter 14 cm, containing water The water level is increased by $9\frac{1}{3}$ cm What is the radius of the ball?

(a) 3.5 cm (b) 7 cm (c) 9 cm (d) 12 cm

252) Three solid spheres of gold whose radii are 1 cm, 6 cm and 8 cm respectively are melted into a single solid sphere. Then the radius of the sphere is

(a) 7 cm (b) 8 cm (c) 9 cm (d) 10 cm

253) A copper sphere of diameter 18 cm is drawn into a wire of diameter 4 mm. Then the length of the wire is

(a) 143 m (b) 243 m (c) 343 m (d) 443 m

254) A hemispherical bowl of internal radius 9 cm contains a liquid. This liquid is to be filled into cylindrical shaped small bottles of diameter 3 cm and height 4 cm. How many bottles will be needed to empty the bowl

(a) 24 (b) 34 (c) 44 (d) 54

255) Which of the following is not a measure of dispersion?

(a) Range (b) Standard deviation (c) Arithmetic mean (d) Variance

256) The range of the data 8, 8, 8, 8, 8. . . 8 is

(a) 0 (b) 1 (c) 8 (d) 3

257) The sum of all deviations of the data from its mean is

(a) Always positive (b) always negative (c) zero (d) non-zero integer

258) The mean of 100 observations is 40 and their standard deviation is 3. The sum of squares of all deviations is

(a) 40000 (b) 160900 (c) 160000 (d) 30000

259) Variance of first 20 natural numbers is

(a) 32.25 (b) 44.25 (c) 33.25 (d) 30

260) The standard deviation of a data is 3. If each value is multiplied by 5 then the new variance is

(a) 3 (b) 15 (c) 5 (d) 225

261) If the standard deviation of x, y, z is p then the standard deviation of 3x + 5, 3y + 5, 3z + 5 is

(a) 3p+5 (b) 3p (c) p + 5 (d) 9p + 15

262) If the mean and coefficient of variation of a data are 4 and 87.5% then the standard deviation is

(a) 3.5 (b) 3 (c) 4.5 (d) 2.5

263) Which of the following is incorrect?

(a) P(A) > 1 (b) $0 \le P(A) \le 1$ (c) $P(\phi) = 0$ (d) $P(A) + P(\bar{A}) = 1$

264) The probability a red marble selected at random from a jar containing p red, q blue and r green marbles is

(a) $\frac{q}{p+q+r}$ (b) $\frac{p}{p+q+r}$ (c) $\frac{p+q}{p+q+r}$ (d) $\frac{p+r}{p+q+r}$

265) A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is

(a) $\frac{3}{10}$ (b) $\frac{7}{10}$ (c) $\frac{3}{9}$ (d) $\frac{7}{9}$

266) The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is

(a) 2 (b) 1 (c) 3 (d) 1.5

267) Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is $\frac{1}{9}$, then the number of tickets bought by Kamalam is

(a) 5 (b) 10 (c) 15 (d) 20

268) If a letter is chosen at random from the English alphabets {a, b,...,z}, then the probability that the letter chosen precedes x

(a) $\frac{12}{13}$ (b) $\frac{1}{13}$ (c) $\frac{23}{26}$ (d) $\frac{3}{26}$

269) A purse contains 10 notes of Rs.2000, 15 notes of Rs.500, and 25 notes of Rs.200. One note is drawn at random. What is the probability that the note is either a Rs. 500 note or Rs.200 note?

(a) $\frac{1}{5}$ (b) $\frac{3}{10}$ (c) $\frac{2}{3}$ (d) $\frac{4}{5}$

270) A girl Calculates the probability of her winning in a match is 0.08 what is the probability of her losing the game

(a) 91% (b) 8% (c) 92% (d) 80%

271) A number x is chosen at random from -4, -3, -2, -1, 0, 1, 2, 3, 4 find the probability that $|x| \leq 4$

(a) 0 (b) 1 (c) $\frac{1}{2}$ (d) $\frac{1}{9}$

272) which of the following is true?

(a) $0 \leq p(\in) \leq 1$ (b) $p(\in) > 1$ (c) $p(\in) < 0$ (d) $-\frac{1}{2} \geq P(\in) \leq \frac{1}{2}$

273) IF the probability of the non-happening of a event is q, then the probability of happening of that event is

(a) 1-q (b) q (c) q/2 (d) $\propto q$

274) The mean of first first 10 odd natural number is

(a) 5 (b) 10 (c) 20 (d) 19

275) The standard deviation is the ____ of variance

(a) cube (b) square (c) square root (d) cube root

276) The variance of 5 values is 16. If each value is doubled. them the standard deviation of new values is_____

(a) 4 (b) 8 (c) 32 (d) 16

277) The mean of a observation $x_1, x_2, x_3, \ldots\ldots x_n$ is $\bar{x}$. If each observation is multiplied by p, there the mean of the new observations is

(a) $\frac{\bar{x}}{p}$ (b) $p\bar{x}$ (c) $\bar{x}$ (d) $P+\bar{x}$

278) If the standard deviation of a variable x is 4 and if $= \frac{3x+5}{4}$, then the standard deviation of y is:

(a) 4 (b) 3.5 (c) 3 (d) 2.5

279) If the data is multiplied by 4, then the corresponding variances is get multiplied by :

(a) 4 (b) 16 (c) 2 (d) None

280) If the co-efficient of variation and standard deviation of a data are 35% and 7.7 respectively then the mean is:

(a) 20 (b) 30 (c) 25 (d) 22

281) Th4e batsman A is more consistent than batsman B if

(a) C.V of A > C.V of B (b) C.V of A < C.V of B (c) C.V of a =C.V of B

(d) C.V of A≥C.V of B

282) If an event occurs surely, then its probabllity is :

(a) 1 (b) 0 (c) $\frac{1}{2}$ (d) $\frac{3}{4}$

283) If the probability of non-happening of an event is, then probability of happening of the event is:

(a) 1-q (b) q (c) $\frac{q}{2}$ (d) 2q

284) In one thousand lottery tickets, there are 50 prizes to be given. The probability of happenning of the event is:

(a) 1-q (b) q (c) $\frac{q}{2}$ (d) 2q

285) When three coins are tossed, the probability of getting the same face on all the three coins is

(a) $\frac{1}{8}$ (b) $\frac{1}{4}$ (c) $\frac{3}{8}$ (d) $\frac{1}{3}$

286) A box contains some milk chocalates and some coco chocokates and there are 60 choolates in the box. If the probability of taking a milk chocolate is $\frac{2}{3}$ then the number of coco chocolates is:

(a) 40 (b) 50 (c) 20 (d) 30

287) Statistically, spread or scatterness of observations in a data is called_____

(a) Discriminant (b) Dispersion (c) Range (d) Standard deviation

288) Mean of squared deviations of some observations from their arithmetic mean is called_____

(a) Standard deviation (b) Variation (c) Median (d) Mode

289) Positive square root of mean of squared deviations of some observations from the arithmetic mean is called_____

(a) Standard deviation (b) Variation (c) Median (d) Mode

290) Sum of deviations of a variable from its mean is always

(a) 0 (b) 1 (c) 2 (d) 5

291) If the co-efficient of variation of marks of Brinda is 25% and that of Buvana is 40% Who is more stable in scoring?

(a) Brinda (b) Buvana (c) Both (d) None

292) lf a digit is chosen at random from the digits 1,2,3, 4, 5,6,7 8,9 then the probability that it is odd is

(a) $\frac{4}{9}$ (b) $\frac{5}{9}$ (c) $\frac{1}{9}$ (d) $\frac{2}{3}$

293) The probability throwing a number greater than 2 with a fair dice is

(a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{2}{3}$ (d) $\frac{1}{3}$

294) A card is dropped from a pack of 52 playing cards. The probability that it is an ace is

(a) $\frac{1}{4}$ (b) $\frac{1}{13}$ (c) $\frac{1}{52}$ (d) $\frac{12}{13}$

295) The probability of a certain event is

(a) 0 (b) 1 (c) $\frac{1}{2}$ (d) Not exists

296) A fair die is thrown once. The probability of getting a prime (or) composite number is

(a) 1 (b) 0 (c) $\frac{5}{6}$ (d) $\frac{1}{6}$

297) $A \cup \bar{A} =$_____

(a) 0 (b) 1 (c) ϕ (d) S

298) $A \cap \bar{A} =$_____

(a) 0 (b) 1 (c) ϕ (d) S

299) $P(\overline{A \cup B}) =$_____

(a) $P(\bar{A} \cup \bar{B})$ (b) $P(\bar{A} \cap \bar{B})$ (c) $P(A \cup B)$ (d) $P(A \cap B)$

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RAVI MATHS TUITION CENTER , WHATSAPP - 8056206308

ANNUAL MINIMUM MATERIALS 2 MARKS

10th Standard

Maths

230 x 2 = 460

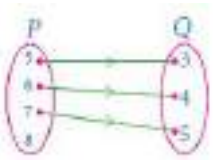
1) If A = {1,3,5} and B = {2,3} then
   (i) find A x B and B x A
   (ii) Is A x B = B x A? If not why?
   (iii) Show that n(A x B) = n(B x A) = n(A) x n(B)

2) If A x B = {(3,2), (3, 4), (5,2), (5, 4)} then find A and B.

3) Find A x B, A x A and B x A
   A = {2, -2, 3} and B = {1,-4}

4) Let A = {1,2,3} and B = {x| x is a prime number less than 10}. Find A x B and B x A.

5) The arrow diagram shows a relationship between the sets P and Q. Write the relation in
   (i) Set builder form
   (ii) Roster form
   (iii) What is the domain and range of R.



6) A Relation R is given by the set {(x,y) / y = x + 3, x ∈ {0, 1, 2, 3, 4, 5}}. Determine its domain and range.

7) Let X = {1, 2, 3, 4} and Y = {2, 4, 6, 8,10} and R = {(1, 2),(2, 4),(3, 6),(4, 8)} Show that R is a function and find its domain, co-domain and range?

8) A relation 'f' $X \to Y$ is defined by f(x) = x^2 - 2 where x ∈ {-2, -1, 0, 3} and Y = R
   (i) List the elements of f
   (ii) Is f a function?

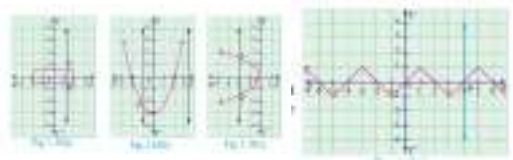
9) Let f{(x, y)| x, y ∈ N and y = 2x}. be a relation on ℕ. Find the domain, co-domain and range. Is this relation a function?

10) Let X = {3, 4, 6, 8}. Determine whether the relation R = {(x, f(x)) | x ∈ X, f(x) = x^2 + 1}. is a function from X to N?

11) Let f(x) = 2x + 5. If x ≠ 0 then find $\frac{f(x+2)-f(2)}{x}$.

12) A plane is flying at a speed of 500 km per hour. Express the distanced travelled by the plane as function of time t in hours.

13) Using vertical line test, determine which of the following curves (Fig.1.18(a), 1.18(b), 1.18(c), 1.18(d)) represent a function?



14) Let f be a function f : N ⟶ N be defined by f(x) = 3x + 2, x ∈ N
   (i) Find the images of 1, 2, 3

(ii) Find the pre-images of 29, 53
(iii) Identify the type of function

15) Let A = {1, 2, 3, 4} and B = N. Let f: A ⟶ B be defined by $f(x) = x^3$ then
(i) find the range of f
(ii) identify the type of function

16) Let A = {-1, 1} and B = {0, 2}. If the function f : A ⟶ B defined by f(x) = ax + b is an onto function? Find a and b.

17) Find f o g and g o f when f(x) = 2x + 1 and $g(x) = x^2 - 2$

18) If f(x) = 3x - 2, g(x) = 2x + k and if f o g = f o f, then find the value of k..

19) If f(x) = 2x - 1, g(x) = $\frac{x+1}{2}$, show that f o g = g o f = x.

20) If X = {–5, 1, 3, 4} and Y = {a, b, c}, then which of the following relations are functions from X to Y ?
R_3 = {(–5, a), (1, a), (3, b),(4, c),(1, b)}

21) If $\left(\frac{x}{3}+1, y-\frac{2}{3}\right) = \left(\frac{5}{3}, \frac{1}{3}\right)$ find the values of 'x' and 'y'

22) If $A = \{-1, 1\}$, find $A \times \mathbf{A} \times \mathbf{A}$

23) If A x B = {(a, x), (a, y), (b, x), (b, y)}, find 'A' and 'B'.

24) Find the quotient and remainder when a is divided by b in the following a = −12, b = 5

25) A positive integer when divided by 88 gives the remainder 61. What will be the remainder when the same number is divided by 11?

26) Can the number 6^n, n being a natural number end with the digit 5 ? Give reason for your answer.

27) Is 7 x 5 x 3 x 2 + 3 a composite number? Justify your answer

28) ' a ' and ' b ' are two positive integers such that a^b x b^a = 800. Find ' a ' and ' b'

29) If $13824 = 2^a \times 3^b$ then find a and b.

30) Determine the value of d such that $15 \equiv 3 \pmod{d}$.

31) Find the least positive value of x such that
$67 + x \equiv 1 \pmod{4}$

32) Solve $8x \equiv 1 \pmod{11}$

33) Compute x, such that $10^4 \equiv x \pmod{19}$

34) Find the number of integer solutions of $3x \equiv 1 \pmod{15}$.

35) Solve $3x - 2 \equiv 0 \pmod{11}$

36) Find the next three terms of the sequences.
$\frac{1}{2}, \frac{1}{6}, \frac{1}{10}, \frac{1}{14}$, ... ,

37) The general term of a sequence is defined as
$a_n = \begin{cases} n(n+3); n \in N \quad is \quad odd \\ n^2+1; n \in N \quad is \quad even \end{cases}$
Find the eleventh and eighteenth terms.

38) Find the first five terms of the following sequence,
$a_1 = 1$, $a_2 = 1$, $a_n = \frac{a_{n-1}}{a_{n-2}+3}; n \geq 3, n \in N$

39) Find a_8 and a_{15} whose n^{th} term is

$$a_n = \begin{cases} \frac{n^2-1}{n+3}; n \quad is \quad even, \quad n\epsilon N \\ \\ \frac{n^2}{2n+1}, n \quad is \quad odd, \quad n\epsilon N \end{cases}$$

40) Write an A.P. whose first term is 20 and common difference is 8.

41) Find the 15^{th}, 24^{th} and n^{th} term (general term) of an A.P. given by 3, 15, 27, 39

42) Find the 19^{th} term of an A.P. -11, -15, -19,....

43) Which term of an A.P. 16,11,6,1,... is -54?

44) Find the middle term(s) of an A.P 9, 15, 21, 27,.....,183.

45) If nine times ninth term is equal to the fifteen times fifteenth term, show that six times twenty fourth term is zero.

46) If 3 + k, 18 - k, 5k + 1 are in A.P. then find k.

47) Find x, y and z, given that the numbers x, 10, y, 24, z are in A.P.

48) In an A.P. the sum of first n terms is $\frac{5n^2}{2} + \frac{3n}{2}$. Find the 17^{th} term

49) Find the sum of the following
3,7,11....up to 40 terms

50) How many consecutive odd integers beginning with 5 will sum to 480?

51) Find the sum of first 28 terms of an A.P. whose n^{th} term is 4n - 3.

52) Find the 8^{th} term of the G.P 9,3,1,....

53) Which of the following sequences are in G.P.?
3, 9, 27, 81,...,

54) In a G.P. 729, 243, 81.....find t_7

55) How many terms of the series 1 + 4 + 16 + ...make the sum 1365?

56) Find the sum 3 + 1+ $\frac{1}{3}$ + ...∞

57) Find the rational form of the number 0.6666....

58) Find the sum of first six terms of the G.P 5,15, 45,....

59) Find the first term of the G.P. whose common ratio 5 and whose sum to first 6 terms is 46872

60) If the first term of an infinite G.P. is 8 and its sum to infinity is $\frac{32}{3}$ then find the common ratio

61) Find the value of
1 + 2 + 3 + ...+ 50

62) Find the sum of
1 + 3 + 5 +..+ to 40 terms

63) Find the sum of
$1^2 + 2^2 + ... + 19^2$

64) Find the sum of
$1^3 + 2^3 + 3^3 + .. + 16^3$

65) If 1+ 2 + 3 +...+ n = 666 then find n.

66) If 1 + 2 + 3 +...+ k = 325, then find $1^3 + 2^3 + 3^3 + ...K^3$.

67) If $1^3 + 2^3 + 3^3 + ...k^3 = 44100$ then find 1 + 2 + 3 +...+ k

68) Find the 12^{th} term from the last term of the A.P -2, -4, -6,....-100

69) Find the least positive value of x such that
$98 \equiv (x + 4) \pmod 5$

70) Find the least positive value of x such that
$78 + x \equiv 3 \pmod 5$

71) Find the first four terms of the sequences whose nth terms are given by
$a_n - (-1)^{n+1} n (n + 1)$

72) Find the sum of the following
$6 + 13 + 20 + ...+ 97$

73) Find the sum of
$2 + 4 + 6 +..+ 80$

74) Find the sum of the following series
$3 + 6 + 9...+ 96$

75) Find the sum of the following series
$51 + 52 + 53 + ... + 92$

76) Find the sum of the following series
$1 + 4 + 9 + 16 +..+ 225$

77) If $2x, x + 10, 3x + 2$ are in A.P. Find x.

78) Find four terms of an A.p. whose sum is 20 and the sum of whose squares is 120

79) Which term of the A.p. -1, 3 ,7, 11 .... is.95?

80) If s_n the sum of first n terms of an A.P. is given by $s_n = 5n^2 + 3n$.Then find the n^{th} term.

81) Solve $2x - 3y = 6, x + y = 1$

82) Find the LCM and GCD for the following and verify that f(x) x g(x) = LCM x GCD
$21x^2y, 35 xy^2$

83) Simplify $\frac{1}{x^2-5x+6} + \frac{1}{x^2-3x+2} - \frac{1}{x^2-8x+15}$

84) Simplify
$\frac{x(x+1)}{x-2} + \frac{x(1-x)}{x-2}$

85) Find the square root of the following expressions
$256(x - a)^8 (x - b)^4 (x - c)^{16} (x - d)^{20}$

86) Find the square root of the following
$4x^2 + 20x + 25$

87) Find the zeroes of the quadratic expression $x^2 + 8x + 12$

88) Write down the quadratic equation in general form for which sum and product of the roots are given below.
9, 14

89) Find the sum and product of the roots for each of the following quadratic equations:
$x^2 + 8x - 65 = 0$

90) Solve $2x^2 - 2\sqrt{6}x + 3 = 0$

91) Solve $x^4 - 13x^2 + 42 = 0$

92) Solve $x^2 - 3x - 2 = 0$

93) Solve $3p^2 + 2\sqrt{5}p - 5 = 0$ by formula method.

94) Solve the following quadratic equations by completing the square method
$9x^2 - 12x + 4 = 0$

95) Find the values of 'k', for which the quadratic equation $kx^2 - (8k + 4)x + 81 = 0$ has real and equal roots?

96) Find the value(s) of 'k' for which the roots of the following equations are real and equal.
$(5k - 6)x^2 + 2kx + 1 = 0$

97) If α and β are the roots of $x^2 + 7x + 10 = 0$ find the values of
$(\alpha - \beta)$

98) If α, β are the roots of the equation $3x^2 + 7x - 2 = 0$, find the values of
$\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

99) If α, β are the roots of the equation $2x^2 - x - 1 = 0$, then form the equation whose roots are
$\frac{1}{\alpha}, \frac{1}{\beta}$

100) Write each of the following expression in terms of α + β and αβ.
$\frac{\alpha}{3\beta} + \frac{\beta}{3\alpha}$

101) If α, β are the roots of $7x^2 + ax + 2 = 0$ and if $\beta - \alpha = \frac{-13}{7}$. Find the values of a.

102) If one root of the equation $2y^2 - ay + 64 = 0$ is twice the other then find the values of a.

103) If one root of the equation $3x^2 + kx + 81 = 0$ (having real roots) is the square of the other then find k.

104) Find the value of a, b, c, d from the equation
$\begin{pmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{pmatrix} = \begin{pmatrix} 1 & 5 \\ 0 & 2 \end{pmatrix}$

105) If $A = \begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & \frac{5}{2} \\ 8 & 3 & 1 \end{bmatrix}$ then verify $(A^T)^T = A$

106) If $A = \begin{bmatrix} 7 & 8 & 6 \\ 1 & 3 & 9 \\ -4 & 3 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 11 & -3 \\ -1 & 2 & 4 \\ 7 & 5 & 0 \end{bmatrix}$ then Find 2A + B.

107) If $A = \begin{bmatrix} 5 & 4 & -2 \\ \frac{1}{2} & \frac{3}{4} & \sqrt{2} \\ 1 & 9 & 4 \end{bmatrix}$, $B = \begin{bmatrix} -7 & 4 & -3 \\ \frac{1}{4} & \frac{7}{2} & 3 \\ 5 & -6 & 9 \end{bmatrix}$, find 4A - 3B.

108) Find the value of a, b, c, d, from the following matrix equation.
$\begin{bmatrix} d & 8 \\ 3b & a \end{bmatrix} + \begin{bmatrix} 3 & a \\ -2 & -4 \end{bmatrix} = \begin{bmatrix} 2 & 2a \\ b & 4c \end{bmatrix} + \begin{bmatrix} 0 & 1 \\ -5 & 0 \end{bmatrix}$

109) If $A = \begin{bmatrix} 1 & 2 & 0 \\ 3 & 1 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 8 & 3 & 1 \\ 2 & 4 & 1 \\ 5 & 3 & 1 \end{bmatrix}$, find AB.

110) If A is of order p x q and B is of order q x r what is the order of AB and BA?

111) If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ prove that $AA^T = I$.

112) Find the LCM of the given expressions.
$(2x^2 - 3xy)^2$, $(4x - 6y)^3$,$8x^3 - 27y^3$

113) Find the LCM and GCD for the following and verify that f(x) x g(x) = LCM x GCD
$(x^3 - 1)(x + 1)$, $(x^3 + 1)$

114) Simplify
$\frac{x^3}{x-y} + \frac{y^3}{y-x}$

115) If α and β are the roots of $x^2 + 7x + 10 = 0$ find the values of
$\alpha^4 + \beta^4$

116) If α and β are the roots of $x^2 + 7x + 10 = 0$ find the values of
$\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$

117) If α, β are the roots of the equation $2x^2 - x - 1 = 0$, then form the equation whose roots are
$\alpha^2\beta$, $\beta^2\alpha$

118) Write each of the following expression in terms of α + β and αβ.
$(3\alpha - 1)(3\beta - 1)$

119) Find the values of x, y and z from the following equations.
$$\begin{bmatrix} x+y & 2 \\ 5+x & xy \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$$

120) Determine the nature of the roots of
(i) $3x^2 - 5x + 2 = 0$
(ii) $x^2 - 2\sqrt{2}x - 6 = 0$,
(iii) $2x^2 - 4x + 3 = 0$
(iv) $x^2 - 4x + 4 = 0$

121)
If $\mathbf{A} = \begin{bmatrix} 1 & -2 \\ 3 & 0 \end{bmatrix}, B = \begin{bmatrix} -1 & 4 \\ 2 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ find $5\,\mathrm{A} - 3\,\mathrm{B} + 2\mathrm{C}$

122) Solve for ' x ' if $\begin{bmatrix} x & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ -2 & 0 \end{bmatrix} = 0$

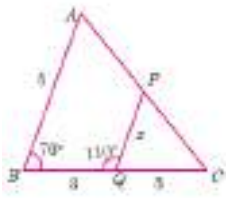
123) Show that △ PST~△ PQR

124) $\angle A = \angle CED$ prove that $\Delta\, CAB \sim \Delta CED$ Also find the value of x.

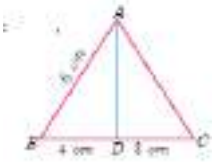
125) If △ ABC is similar to△ DEF such that BC = 3 cm, EF = 4 cm and area of △ ABC = 54 cm^2. Find the area of △ DEF.

126) Check whether the which triangles are similar and find the value of x.
(i)

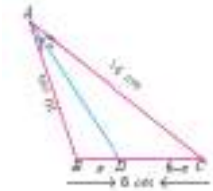
(ii)



127) In the figure, AD is the bisector of $\angle$ A. If BD = 4 cm, DC = 3 cm and AB = 6 cm, find AC.

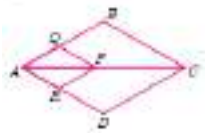


128) In the Figure, AD is the bisector of $\angle$ BAC, if A = 10 cm, AC = 14 cm and BC = 6 cm. Find BD and DC.



129) In $\triangle$ ABC, D and E are points on the sides AB and AC respectively. For each of the following cases show that DE||BC
AB = 12 cm, AD = 8 cm, AE = 12 cm and AC = 18 cm.

130) In fig. if PQ || BC and PR ||CD prove that

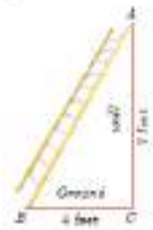


$\frac{AB}{AD} = \frac{AQ}{AB}$

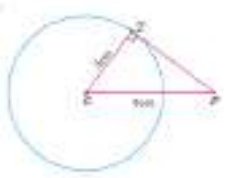
131) Check whether AD is bisector $\angle$ A of $\triangle$ ABC in each of the following AB = 5cm, AC = 10cm, BD = 1.5cm and CD = 3.5cm

132) An insect 8 m away initially from the foot of a lamp post which is 6 m tall, crawls towards it moving through a distance. If its distance from the top of the lamp post is equal to the distance it has moved, how far is the insect away from the foot of the lamp post?

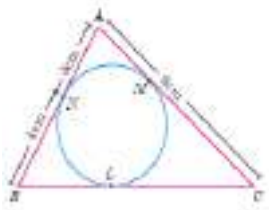
133) What length of ladder is needed to reach a height of 7 ft along the wall when the base of the ladder is 4 ft from the wall? Round off your answer to the next tenth place.



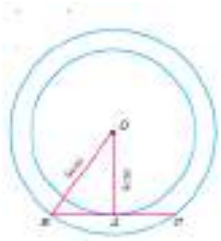
134) Find the length of the tangent drawn from a point whose distance from the centre of a circle is 5 cm and radius of the circle is 3 cm.



135) In Fig, △ ABC is circumscribing a circle. Find the length of BC.



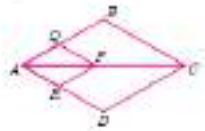
136) If radii of two concentric circles are 4 cm and 5 cm then find the length of the chord of one circle which is a tangent to the other circle



137) The length of the tangent to a circle from a point P, which is 25 cm away from the centre is 24 cm. What is the radius of the circle?

138) A circle is inscribed in △ ABC having sides 8 cm, 10 cm and 12 cm as shown in figure, find AD, BE and CF.

139) In fig. if PQ || BC and PR || CD prove that



$\frac{QB}{AQ} = \frac{DR}{AR}$

140) Check whether AD is bisector ∠ A of △ ABC in each of the following AB = 4cm, AC = 6cm, BD = 1.6cm and CD = 2.4cm.

141) D is the mid point of side BC and AE ⊥ BC. If BC = a ,AC = b ,AB = c ,ED = x ,AD = p and AE = h , prove that

$c^2 = p^2 - ax + \frac{a^2}{4}$

142) D is the mid point of side BC and AE ⊥ BC. If BC = a ,AC = b ,AB = c ,ED = x ,AD = p and AE = h , prove that

$b^2 + c^2 = 2p^2 + \frac{a^2}{2}$

143) Find the area of the triangle formed by the points (1, –1), (–4, 6) and (–3, –5)

144) Determine whether the sets of points are collinear? $(-\frac{1}{2}, 3)$, (- 5, 6) and (-8, 8)

145) Vertices of given triangles are taken in order and their areas are provided aside. In each case, find the value of 'p'?

S.No	Vertices	Area (sq.units)
(i)	(0, 0), (p, 8), (6, 2)	20
(ii)	(p, p), (5, 6), (5, -2)	32

146) In each of the following, Find the value of 'a' for which the given points are collinear. (2, 3), (4, a) and (6, –3)

147) Find the slope of a line joining the given points (- 6, 1) and (-3, 2)

148) The line r passes through the points (–2, 2) and (5, 8) and the line s passes through the points (–8, 7) and (–2, 0). Is the line r perpendicular to s ?

149) The line p passes through the points (3, - 2), (12, 4) and the line q passes through the points (6, -2) and (12, 2). Is parallel to q ?

150) Show that the points (-2, 5), (6, -1) and (2, 2) are collinear

151) What is the slope of a line perpendicular to the line joining A(5, 1) and P where P is the mid-point of the segment joining (4, 2) and (-6, 4).

152) If the three points (3, - 1) , (a, 3) and (1, - 3) are collinear, find the value of a.

153) The line through the points (-2, a) and (9, 3) has slope - $\frac{1}{2}$. Find the value of a.

154) The line through the points (-2, 6) and (4, 8) is perpendicular to the line through the points (8, 12) and (x, 24) . Find the value of x.

155) Show that the given vertices form a right angled triangle and check whether its satisfies Pythagoras theorem A(1, - 4) , B(2, - 3) and C(4, - 7)

156) Find the equation of the straight line passing through (5, 7) and is Parallel to X axis

157) Find the equation of a straight line whose Slope is 5 and y intercept is -9

158) Calculate the slope and y intercept of the straight line 8x − 7y + 6 = 0

159) Find the equation of a line passing through the point (3, - 4) and having slope $\frac{-5}{7}$

160) Find the equation of a line passing through the point A(1,4) and perpendicular to the line joining points (2, 5) and (4, 7).

161) The equation of a straight line is 2(x - y) + 5 = 0. Find its slope, inclination and intercept on the Y axis.

162) Find the value of 'a', if the line through (–2, 3) and (8, 5) is perpendicular to y = ax + 2

163) Find the equation of a line through the given pair of points $\left(2, \frac{2}{3}\right)$ and $\left(\frac{-1}{2}, 2\right)$

164) Find the equation of a straight line which has Slope $\frac{-5}{4}$ passing through the point (–1, 2).

165) Find the slope of the straight line 6x + 8y + 7 = 0.

166) Check whether the given lines are parellel or perpendicular

$\frac{x}{3} + \frac{y}{4} + \frac{1}{7}$ and $\frac{2x}{3} + \frac{y}{2} + \frac{1}{10}$

167) If the straight lines 12y = -(p + 3)x + 12, 12x - 7y = 16 are perpendicular then fi nd 'p'.

168) Find the equation of a straight line whose Inclination is 45^0 and y intercept is 11

169) Find the area of the triangle formed by the points :(–10, –4), (–8, –1) and (–3, –5)

170) Check whether the given lines are parellel or perpendicular : 5x + 23y + 14 = 0 and 23x − 5y + 9 = 0

171) Find the area of quadrilateral whose vertices are (- 1, - 1), (- 1, 4), (5,4) and (5, - 1)

172) Find the equation of the straight line passing through the points (a, b) and (a + b, a - b).

173) Prove that $\tan^2\theta - \sin^2\theta = \tan^2\theta \sin^2\theta$

174) prove that $1+\frac{cot^2\theta}{1+cosec\theta} = cosec\theta$

175) prove that $\sqrt{\frac{1+cos\theta}{1-cos\theta}} = cosec\theta + cot\theta$

176) prove the following identity.
$\cot\theta + \tan\theta = \sec\theta \, cosec\theta$

177) prove the following identities. $\frac{1-tan^2\theta}{cot^2\theta-1} = tan^2\theta$

178) prove the following identity.
$\sqrt{\frac{1+sin\theta}{1-sin\theta}} = sec\theta + tan\theta$

179) A tower stands vertically on the ground. from a point on the ground,which is 48m away from the foot of the tower, the angel of elevation of the top of the tower is 30°.find the hieght of the tower.

180) Find the angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of a tower of height $10\sqrt{3}m$

181) From the top of a rock $50\sqrt{3}$ m high, the angle of depression of a car on the ground is observed to be 30°. Find the distance of the car from the rock.

182) A player sitting on the top of a tower of height 20 m observes the angle of depression of a ball lying on the ground as 60° . Find the distance between the foot of the tower and the ball.($\sqrt{3}$ =1.732)

183) prove the following identities
$\sqrt{\frac{1+sin\theta}{1-sin\theta}} + \sqrt{\frac{1+sin\theta}{1-sin\theta}} = 2sec\theta$

184) Prove the trigonometric identity
$\left(1+\tan^2\theta\right)(1+\sin\theta)(1-\sin\theta) = 1$

185) Prove the trigonometric identity $\tan^2\theta - \frac{1}{\cos^2\theta} = -1$

186) A kite is flying at a height of 60 m above the ground. The inclination of the string with the ground where its string is tied is 60º. Find the length of the string.

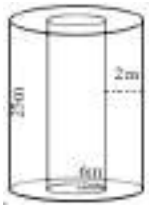
187) The angle of depression of a vehicle on the ground from the top of a tower is 60º. If the vehicle is at a distance of 100 m away from the building, find,the height of the tower.

188) A cylindrical drum has a height of 20 cm and base radius of 14 cm. Find its curved surface area and the total surface area.

189) The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2 . Find the diameter of the cylinder.

190) A garden roller whose length is 3 m long and whose diameter is 2.8 m is rolled to level a garden. How much area will it cover in 8 revolutions?

191) If one litre of paint covers 10 m^2, how many litres of paint is required to paint the internal and external surface areas of a cylindrical tunnel whose thickness is 2 m, internal radius is 6 m and height is 25 m.



192) The radius of a conical tent is 7 m and the height is 24 m. Calculate the length of the canvas used to make the tent if the width of the rectangular canvas is 4 m?

193) If the total surface area of a cone of radius 7cm is 704 cm^2, then find its slant height.

194) If the base area of a hemispherical solid is 1386 sq. metres, then find its total surface area?

195) The slant height of a frustum of a cone is 5 cm and the radii of its ends are 4 cm and 1 cm. Find its curved surface area.

196) The radius of a sphere increases by 25%. Find the percentage increase in its surface area.

197) Find the volume of a cylinder whose height is 2 m and whose base area is 250 m^2.

198) The volume of a solid right circular cone is 11088 cm^3. If its height is 24 cm then find the radius of the cone.

199) The ratio of the volumes of two cones is 2 : 3. Find the ratio of their radii if the height of second cone is double the height of the first.

200) If the circumference of a conical wooden piece is 484 cm then find its volume when its height is 105 cm.

201) If the ratio of radii of two spheres is 4 : 7, find the ratio of their volumes.

202) Find the total surface area of a cone, if its slant height is 21 m and diameter of its base is 24 m

203) The circumference of the base of a cylindrical vessel is 132 cm and its height is 25 cm. How many litres of water it can hold?

204) The height of the cone is 15 cm. If its. volume is 1570 cm^3, find the radius of the base.

205) The radius of a cone is 20 cm. If its volume is 8800 cm^3, find the height of the base

206) Find the value of the radius of a sphere whose surface area is 36π sq. units

207) Find the surface area of the earth whose diameter is 12756 kms.

208) Find the range and coefficient of range of the following data: 25, 67, 48, 53, 18, 39, 44.

209) The range of a set of data is 13.67 and the largest value is 70.08. Find the smallest value.

210) Find the range and coefficient of range of the following data. 63, 89, 98, 125, 79, 108, 117, 68

211) If the range and the smallest value of a set of data are 36.8 and 13.4 respectively, then find the largest value.

212) Find the standard deviation of first 21 natural numbers.

213) If the standard deviation of a data is 4.5 and if each value of the data is decreased by 5, then find the new standard deviation.

214) The mean of a data is 25.6 and its coefficient of variation is 18.75. Find the standard deviation.

215) The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the coefficient of variation.

216) If n = 5 , $\bar{x}$ = 6, Σx^2 = 765 then calculate the coefficient of variation.

217) Find the coefficient of variation of 24, 26, 33, 37, 29, 31.

218) Two coins are tossed together. What is the probability of getting different faces on the coins?

219) What is the probability that a leap year selected at random will contain 53 saturdays. (Hint: 366 = 52 x 7 + 2)

220) If A is an event of a random experiment such that P(A) : P($\bar{A}$) = 17.15 and n(S) = 640 then find (i) P($\bar{A}$) (ii) n(A).

221) A coin is tossed thrice. What is the probability of getting two consecutive tails?

222) If P(A).= 0.37, P(B).= 0.42, P(A∩B) = 0.09 then find P(AUB).

223) A card is drawn from a pack of 52 cards. Find the probability of getting a king or a heart or a red card.

224) If P(A) = $\frac{2}{3}$, P(B) = $\frac{2}{5}$, P(A U B) = $\frac{1}{3}$ then find P(A ∩ B).

225) A and B are two events such that, P(A) = 0.42, P(B) = 0.48, P(A ∩ B) = 0.16. Find (i) P(not A) (ii) P(not B) (iii) P(A or B)

226) If A and B are two mutually exclusive events of a random experiment and P(not A) = 0.45, P(A U B) = 0.65, then find P(B).

227) The probability that atleast one of A and B occur is 0.6. If A and B occur simultaneously with probability 0.2, then find $P(\bar{A}) + P(\bar{B})$.

228) Find the range and coefficient of range of the following data.
43.5, 13.6, 18.9, 38.4, 61.4, 29.8

229)
If $P(A) = \frac{1}{3}, P(B) = \frac{1}{2}, P(A \cap B) = \frac{1}{4}$, then finc $P\left(A' \cap B'\right)$

230) Given $P(A) = \frac{3}{5}$ and $P(B) = \frac{1}{5}$. Find $P(A \text{ or } B)$ if A and B are mutually exclusive eyents.

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Ravi Maths Tuition Centre

ANNUAL MINIMUM MATERIALS 5 MARKS

10th Standard

Maths

200 x 5 = 1000

1) Let A = {x ∈ N| 1 < x < 4}, B = {x ∈ W| 0 ≤ x < 2) and C = {x ∈ N| x < 3} Then verify that
   (i) A x (B U C) = (A x B) U (A x C)
   (ii) A x (B ∩ C) = (A x B) ∩ (A x C)

2) If B x A = {(-2,3), (-2,4),(0,3), (0,4),(3,3),(3,4)} find A and B.

3) If A = {5,6}, B = {4,5,6}, C = {5,6,7}, Show that A x A = (B x B) ∩ (C x C)

4) Given A = {1,2,3}, B = {2,3,5}, C = {3,4} and D = {1,3,5}, check if (A ∩ C) x (B ∩ D) = (A x B) ∩ (C x D) is true?

5) Let A = {x ∈ W| x < 2}, B = {x ∈ N| 1 < x ≤ 4} and C = (3,5). Verify that A x (B U C) = (A x B) U (A x C)

6) Let A = The set of all natural numbers less than 8, B = The set of all prime numbers less than 8, C = The set of even prime number. Verify that (A ∩ B) x C = (A x C) ∩ (B x C)

7) A graph representing the function f (x) is given in Fig it is clear that f (9) = 2.
   (i) Find the following values of the function
   (a) f(0)
   (b) f(7)
   (c) f(2)
   (d) f(10)
   (ii) For what value of x is f (x) = 1?
   (iii) Describe the following (i) Domain (ii) Range.
   (iv) What is the image of 6 under f ?

Fig. 1.16

8) If the function f: R⟶ R defined by

$$f(x) = \begin{cases} 2x+7, x < -2 \\ x^2 - 2, -2 \le x < 3 \\ 3x - 2, x \ge 3 \end{cases}$$

(i) f(4)
(ii) f(-2)
(iii) f(4) + 2f(1)
(iv) $\frac{f(1)-3f(4)}{f(-3)}$

9) Let f: A ⟶ B be a function defined by f(x) = $\frac{x}{2}$-1, where A = {2, 4 , 6, 10, 12}, B = {0, 1, 2, 4, 5, 9}, Represent f by
(i) set of ordered pairs
(ii) a table
(iii) an arrow diagram
(iv) a graph

10) A function f: [-5,9] ⟶ R is defined as follows:

$$f(x) = \begin{cases} 6x+1 & \text{if } -5 \le x < 2 \\ 5x^2 - 1 & \text{if } 2 \le x < 6 \\ 3x - 4 & \text{if } 6 \le x \le 9 \end{cases}$$

Find
i) f(-3) + f(2)
ii) f(7) - f(1)
iii) 2f(4) + f(8)
iv) $\frac{2f(-2)-f(6)}{f(4)+f(-2)}$

11) The function 't' which maps temperature in Celsius (C) into temperature in Fahrenheit (F) is defined by t(C) = F where F = $\frac{9}{5}$C + 32. Find,
(i) t(0)
(ii) t(28)
(iii) t(-10)
(iv) the value of C whenn t(C) = 212
(v) the temperature when the Celsius value is equal to the Fahrenheit value.

12) Find x if gff(x) = fgg(x), given f(x) = 3x + 1 and g(x) = x + 3.

13) Consider the functions f(x), g(x), h(x) as given below. Show that (f o g) o h = f o (g o h) in each case.

(i) $f(x) = x - 1$, $g(x) = 3x + 1$ and $h(x) = x^2$

(ii) $f(x) = x^2$, $g(x) = 2x$ and $h(x) = x + 4$

(iii) $f(x) = x - 4$, $g(x) = x^2$ and $h(x) = 3x - 5$

14) Find the HCF of 396, 504, 636.

15) If $p_1^{x_1} \times p_2^{x_2} \times p_3^{x_3} \times p_4^{x_4} = 113400$ where p_1, p_2, p_3, p_4 are primes in ascending order and x_1, x_2, x_3, x_4 are integers, find the value of p_1, p_2, p_3, p_4 and x_1, x_2, x_3, x_4

16) What is the smallest number that when divided by three numbers such as 35, 56 and 91 leaves remainder 7 in each case?

17) Determine the general term of an A.P. whose 7^{th} term is -1 and 16^{th} term is 17.

18) In an A.P., sum of four consecutive terms is 28 and their sum of their squares is 276. Find the four numbers.

19) The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.

20) The ratio of 6^{th} and 8^{th} term of an A.P is 7:9 Find the ratio of 9^{th} term to 13^{th} term

21) How many terms of the series 1 + 5 + 9 + ...must be taken so that their sum is 190?

22) The 13^{th} term of an A.P is 3 and the sum of the first 13 terms is 234.Find the common difference and the sum of first 21 terms.

23) Find the sum of all natural numbers between 300 and 600 which are divisible by 7.

24) The sum of first n, 2n and 3n terms of an A.P are S_1, S_2 and S_3 respectively prove that $S_3 = 3 (S_2 - S_1)$

25) The sum of first n terms of a certain series is given as $2n^2 - 3n$.Show that the series is an A.P

26) Find the sum of all odd positive integers less than 450.

27) Find the sum of all natural numbers between 602 and 902 which are not divisible by 4.

28) In a Geometric progression, the 4^{th} term is $\frac{8}{9}$ and the 7th term is $\frac{64}{243}$. Find the Geometric Progression.

29) The product of three consecutive terms of a Geometric Progression is 343 and their sum is $\frac{91}{3}$.Find the three terms.

30) In a G.P. the 9^{th} term is 32805 and 6^{th} term is 1215. Find the 12^{th} term

31) Find the 10^{th} term of a G.P. whose 8^{th} term is 768 and the common ratio is 2

32) In a G.P. the product of three consecutive terms is 27 and the sum of the product of two terms taken at a time is $\frac{57}{2}$.Find the three terms.

33) Find the sum to n terms of the series 5 + 55 + 555 +...

34) Find the least positive integer n such that $1 + 6 + 6^2 + ... + 6^n > 5000$

35) Find the sum to n terms of the series
0.4 + 0.44 + 0.444 +..to n terms

36) How many terms of the series $1^3 + 2^3 + 3^3$ +....Should be taken to get the sum 14400?

37) The sum of the cubes of the first n natural numbers is 2025. then Find the value of n.

38) Find the sum of
$5^2 + 10^2 + 15^2 + ... + 105^2$

39) Find the sum of
$9^3 + 10^3 + ... + 21^3$

40) Solve $\frac{1}{3}(x + y - 5) = y - z = 2x - 11 = 9 - (x + 2z)$.

41) Find the GCD of the following by division algorithm $2x^4 + 13x^3 + 27x^2 + 23x + 7$, $x^3 + 3x^2 + 3x + 1$, $x^2 + 2x + 1$

42) Find the square root of $289x^4 - 612x^3 + 970x^2 - 684x + 361$

43) Given A = $\begin{pmatrix} p & 0 \\ 0 & 2 \end{pmatrix}$, B = $\begin{pmatrix} 0 & -q \\ 1 & 0 \end{pmatrix}$, C = $\begin{pmatrix} 2 & -2 \\ 2 & 2 \end{pmatrix}$ and if $BA = C^2$, find p and q.

44) Solve $x + 2y - z = 5$; $x - y + z = -2$; $-5x - 4y + z = -11$

45) Solve $\frac{x}{2} - 1 = \frac{y}{6} + 1 = \frac{z}{7} + 2$; $\frac{y}{3} + \frac{z}{2} = 13$

46) Solve: $\frac{1}{2x} + \frac{1}{4y} - \frac{1}{3z} = \frac{1}{4}$; $\frac{1}{x} = \frac{1}{3y}$; $\frac{1}{x} - \frac{1}{5y} + \frac{4}{z} = 2\frac{2}{15}$

47) Vani, her father and her grand father have an average age of 53. One-half of her grand father's age plus one-third of her father's age plus one fourth of

Vani's age is 65. Four years ago if Vani's grandfather was four times as old as Vani then how old are they all now?

48) The sum of the digits of a three-digit number is 11. If the digits are reversed, the new number is 46 more than five times the former number. If the hundreds digit plus twice the tens digit is equal to the units digit, then find the original three digit number?

49) Find the GCD of $6x^3 - 30x^2 + 60x - 48$ and $3x^3 - 12x^2 + 21x - 18$.

50) Find the LCM of each pair of the following polynomials
$a^2 + 4a - 12$, $a^2 - 5a + 6$ whose GCD is $a - 2$

51) If $x = \frac{a^2+3a-4}{3a^2-3}$ and $y = \frac{a^2+2a-8}{2a^2-2a-4}$ find the value of x^2y^{-2}

52) Find $\frac{x^2+20x+36}{x^2-3x-28} - \frac{x^2+12x+4}{x^2-3x-28}$

53) If $A = \frac{2x+1}{2x-1}$, $B = \frac{2x-1}{2x+1}$ find $\frac{1}{A-B} - \frac{2B}{A^2-B^2}$

54) If $A = \frac{x}{x+1}$, $B = \frac{1}{x+1}$, prove that $\frac{(A+B)^2+(A-B)^2}{A \div B} = \frac{2\left(x^2+1\right)}{x(x+1)^2}$

55) Pari needs 4 hours to complete a work. His friend Yuvan needs 6 hours to complete the same work. How long will it take to complete if they work together?

56) Find the square root of the expression $\frac{4x^2}{y^2} + \frac{20x}{y} + 13 - \frac{30y}{x} + \frac{9y^2}{x^2}$

57) If $9x^4 + 12x^3 + 28x^2 + ax + b$ is a perfect square, find the values of a and b.

58) Find the values of m and n if the following expressions are perfect sqaures
$\frac{1}{x^4} - \frac{6}{x^3} + \frac{13}{x^2} + \frac{m}{x} + n$

59) Solve $\frac{x}{x-1} + \frac{x-1}{x} = 2\frac{1}{2}$

60) Solve $pqx^2 - (p + q)^2x + (p + q)^2 = 0$

61) The product of Kumaran's age (in years) two years ago and his age four years from now is one more than twice his present age. What is his present age?

62) A passenger train takes 1 hr more than an express train to travel a distance of 240 km from Chennai to Virudhachalam. The speed of passenger train is less than that of an express train by 20 km per hour. Find the average speed of both the trains.

63) If the difference between a number and its reciprocal is $\frac{24}{5}$, find the number.

64) A bus covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hour more it would have taken 30 minutes less for the journey. Find the original speed of the bus.

65) From a group of $2x^2$ black bees , square root of half of the group went to a tree. Again eight-ninth of the bees went to the same tree. The remaining two got caught up in a fragrant lotus. How many bees were there in total?

66) The hypotenuse of a right angled triangle is 25 cm and its perimeter 56 cm. Find the length of the smallest side.

67) Prove that the equation $x^2(p^2 + q^2) + 2x(pr + qs) + r^2 + s^2 = 0$ has no real roots. If ps = qr, then show that the roots are real and equal.

68) If the roots of $(a - b)x^2 + (b - c)x + (c - a) = 0$ are real and equal, then prove that b, a, c are in arithmetic progression.

69) If a, b are real then show that the roots of the equation $(a - b)x^2 - 6(a + b)x - 9(a - b) = 0$ are real and unequal.

70) If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - ac = 0$ are real and equal prove that either a = 0 (or) $a^3 + b^3 + c^3 = 3abc$.

71) Find X and Y if $X + Y = \begin{bmatrix} 7 & 0 \\ 3 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$

72) Find x and y if $x\begin{bmatrix} 4 \\ -3 \end{bmatrix} + y\begin{bmatrix} -2 \\ 3 \end{bmatrix} = \begin{bmatrix} 4 \\ 6 \end{bmatrix}$

73) Solve for x, y : $\begin{bmatrix} x^2 \\ y^2 \end{bmatrix} + 2\begin{bmatrix} -2x \\ -y \end{bmatrix} = \begin{bmatrix} -5 \\ 8 \end{bmatrix}$

74) If $A = \begin{bmatrix} 1 & -1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 \\ 2 & 1 \\ 1 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$ show that (AB)C = A(BC)

75) If $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$ show that $(AB)^T = B^TA^T$

76) Given that $A = \begin{bmatrix} 1 & 3 \\ 5 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 5 & 2 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 3 & 2 \\ -4 & 1 & 3 \end{bmatrix}$ verify that A(B + C) = AB + AC.

77) Let $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$ Show that A(BC) = (AB)C

78) If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ show that $A^2 - (a + d) A = (bc - ad)I_2$

79) Solve the following system of linear equations in three variables

$\frac{1}{x} - \frac{2}{y} + 4 = 0$; $\frac{1}{y} - \frac{1}{z} + 1 = 0$; $\frac{2}{z} + \frac{3}{x} = 14$

80) Discuss the nature of solutions of the following system of equations

$2y + z = 3(-x + 1)$; $-x + 3y - z = -4$; $3x + 2y + z = -\frac{1}{2}$

81) Find the GCD of each pair of the following polynomials

$(x^3 + y^3)$, $(x^4 + x^2y^2 + y^4)$ whose LCM is $(x^3 + y^3)(x^2 + xy + y^2)$

82) Find the square root of the following

$$\left(2x^2 + \frac{17}{6}x + 1\right)\left(\frac{3}{2}x^2 + 4x + 2\right)\left(\frac{4}{3}x^2 + \frac{11}{3}x + 2\right)$$

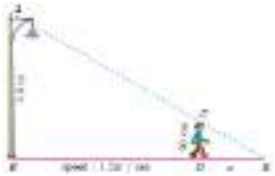
83) Find the values of m and n if the following expressions are perfect sqaures

$x^4 - 8x^3 + mx^2 + nx + 16$

84) Let $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$ Show that $(A - B)C = AC - BC$

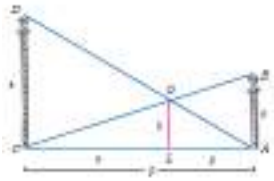
85) Let $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$ Show that $(A - B)^T = A^T - B^T$

86) A boy of height 90cm is walking away from the base of a lamp post at a speed of 1.2m/sec. If the lamppost is 3.6m above the ground, find the length of his shadow cast after 4 seconds.



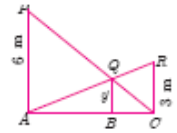
87) Two poles of height 'a' metres and 'b' metres are 'p' metres apart. Prove that the height of the point of intersection of the lines joining the top of each pole

to the foot of the opposite pole is given by $\frac{ab}{a+b}$ meters

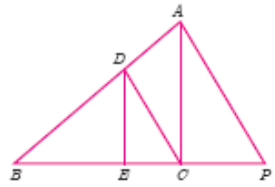


88) A girl looks the reflection of the top of the lamp post on the mirror which is 6.6 m away from the foot of the lamppost. The girl whose height is 12.5 m is standing 2.5 m away from the mirror. Assuming the mirror is placed on the ground facing the sky and the girl, mirror and the lamppost are in a same line, find the height of the lamp post.

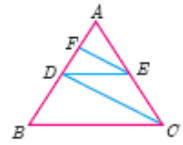
89) Two vertical poles of heights 6 m and 3 m are erected above a horizontal ground AC. Find the value of y.



90) In the figure DE||AC and DC||AP. Prove that $\frac{BE}{CE} = \frac{BC}{CP}$



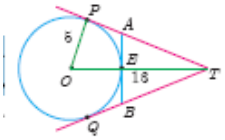
91) In figure DE || BC andCD. Prove that AD^2 = AB x AF



92) An Aeroplane after take off from an airport and flies due north at a speed of 1000 km/hr. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200 km/hr. How far apart will be the two planes after 1½ hours?

93) In figure, O is the centre of the circle with radius 5 cm. T is a point such that OT = 13 cm and OT intersects the circle E, if AB is the tangent to the circle at

E, find the lenght of AB



94) Show that the angle bisectors of a triangle are concurrent.

95) Converse of Angle Bisector Theorem

96) State the Pythagoras Theorem

97) State the Alternate Segment theorem

98) State and Prove - Angle Bisector Theorem

99) Converse of Basic Proportionality Theorem

100) If the area of the triangle formed by the vertices A(-1, 2) , B(k, -2) and C(7, 4) (taken in order) is 22 sq. units, find the value of k.

101) If the points P(-1, -4), Q (b, c) and R(5, -1) are collinear and if 2b + c = 4, then find the values of b and c.

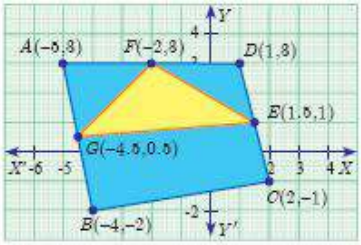
102) The floor of a hall is covered with identical tiles which are in the shapes of triangles. One such triangle has the vertices at (-3, 2), (-1, -1) and (1, 2). If the floor of the hall is completely covered by 110 tiles, find the area of the floor.

103) Find the area of the quadrilateral formed by the points (8, 6), (5, 11), (-5, 12) and (-4, 3).

104) If the points A(- 3, 9) , B(a, b) and C(4, - 5) are collinear and if a + b = 1 , then find a and b.

105) Let P(11, 7), Q(13.5, 4) and R(9.5, 4) be the midpoints of the sides AB, BC and AC respectively of Δ ABC. Find the coordinates of the vertices A, B and C. Hence find the area of Δ ABC and compare this with area of ΔPQR.

106) In the figure, find the area of triangle AGF



107) A(1, -2) , B(6, -2), C(5, 1) and D(2, 1) be four points Find the slope of the line segment (a) AB (b) CD

108) If the points A(2, 2), B(–2, –3), C(1, –3) and D(x, y) form a parallelogram then find the value of x and y.

109) Let A(3, - 4), B(9, - 4) , C(5, - 7) and D(7, - 7). Show that ABCD is a trapezium.

110) A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through (-3,8). Find its equation

111) Find the equation of the median and altitude of Δ ABC through A where the vertices are A(6, 2), B(-5,-1) and C(1, 9)

112) Find the equation of a line whose intercepts on the x and y axes are given below. 4, -6

113) Find the equation of a straight line Passing through (1, -4) and has intercepts which are in the ratio 2:5

114) Find the equation of a straight line which is parallel to the line 3x - 7y = 12 and passing through the point (6, 4).

115) A(-3, 0) B(10, - 2) and C(12, 3) are the vertices of ΔABC. Find the equation of the altitude through A and B.

116) Find the equation of the perpendicular bisector of the line joining the points A(-4, 2) and B(6, -4).

117) Find the equation of a straight line through the intersection of lines 7x + 3y = 10, 5x − 4y = 1 and parallel to the line 13x + 5y + 12 = 0

118) Find the equation of a straight line through the intersection of lines 5x − 6y = 2, 3x + 2y = 10 and perpendicular to the line 4x − 7y + 13 = 0

119) Find the equation of a straight line joining the point of intersection of 3x + y + 2 = 0 and x − 2y − 4 = 0 to the point of intersection of 7x − 3y = − 12 and 2y = x + 3

120) Find the equation of a straight line through the point of intersection of the lines 8x + 3y = 18, 4x + 5y = 9 and bisecting the line segment joining the points (5, –4) and (–7, 6).

121) Find the area of a triangle formed by the lines 3x + y− 2 = 0 , 5x + 2y − 3 = 0 and 2x − y − 3 = 0

122) A(1, -2) , B(6, -2), C(5, 1) and D(2, 1) be four points Find the slope of the line segment (a) BC (b) AD

123) if $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$, then prove that $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$

124) prove that $(\operatorname{cosec}\theta - \sin\theta)(\sec\theta - \cos\theta)(\tan\theta + \cot\theta) = 1$

125) prove that $\frac{sinA}{1+cosA} + \frac{sinA}{1-cosA} = 2cosecA.$

126) if $\operatorname{cosec}\theta + \cot\theta = p$, then prove that $\cos\theta = \frac{p^2-1}{p^2+1}$

127) prove that $\left(\frac{\cos^3 A - \sin^3 A}{\cos A - \sin A}\right) - \left(\frac{\cos^3 A + \sin^3 A}{\cos A + \sin A}\right) = 2\sin A\cos A$

128) prove that $\frac{(1+\cot A+\tan A)(\sin A-\cos A)}{\sec^3 A-\operatorname{cosec}^3 A} = \sin^2 A\cos^2 A$

129) If $\frac{\cos^2\theta}{\sin\theta} = p$ and $\frac{\sin^2\theta}{\cos\theta} = q$, then prove that $p^2q^2(p^2 + q^2 + 3) = 1$

130) prove the following identities.
$\sec^6\theta = \tan^6\theta + 3\tan^2\theta\sec^2\theta + 1$

131) If $\frac{\cos\alpha}{\cos\beta} = m$ and $\frac{\cos\alpha}{\sin\beta} = n$, then prove that $(m^2 + n^2)\cos^2\beta = n^2$

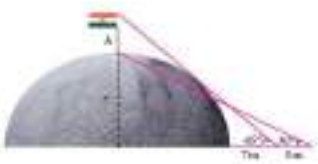
132) if $\sin\theta + \cos\theta = p$ and $\sec\theta = p$ and $\sec\theta + \operatorname{cosec}\theta = q$, then prove that $q(p^2 - 1) = 2p$

133) Two ships are sailing in the sea on either sides of a lighthouse as observed from the ships are 30° and 45° respectively. if the lighthouse is 200 m high, find the distance between the two ships. $\left(\sqrt{3} = 1.732\right)$

134) From a point on the ground, the angles of elevation of the bottom and top of a tower fixed at the top of a 30m high building are 45°and 60° respectively. find the hieght of the tower. ($\sqrt{3} = 1.732$)

135) To a man standing outside his house, the angles of elevation of the top and bottom of a window are 60° and 45° respectively. If the height of the man is 180 cm and if he is 5 m away from the wall, what is the height of the window? ($\sqrt{3} = 1.732$)

136) A flag pole of height 'h' metres is on the top of the hemispherical dome of radius 'r' metres. A man is standing 7 m away from the dome. Seeing the top of the pole at an angle 45° and moving 5 m away from the dome and seeing the bottom of the pole at an angle 30°. Find (i) the height of the pole (ii) radius of the ($\sqrt{3} = 1.732$)



137) The top of a 15 m high tower makes an angle of elevation of 60° with the bottom of an electronic pole and angle of elevation of 30° with the top of the

pole. What is the height of the electric pole?

138) An aeroplane at an altitude of 1800 m finds that two boats are sailing towards it in the same direction. The angles of depression of the boats as observed from the aeroplane are 60° and 30° respectively. Find the distance between the two boats.($\sqrt{3}$ = 1.732)

139) From the top of a lighthouse, the angle of depression of two ships on the opposite sides of it are observed to be 30° and 60°. If the height of the lighthouse is h meters and the line joining the ships passes through the foot of the lighthouse, show that the distance between the ships is $\frac{4h}{\sqrt{3}}$m.

140) A lift in a building of height 90 feet with transparent glass walls is descending from the top of the building. At the top of the building, the angle of depression to a fountain in the garden is 60°.Two minutes later, the angle of depression reduces to 30°. If the fountain is $30\sqrt{3}$ feet from the entrance of the lift, find the speed of the lift which is descending.

141) A man is standing on the deck of a ship, which is 40 m above water level. He observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill as 30° . Calculate the distance of the hill from the ship and the height of the hill. ($\sqrt{3}$ = 1.732)

142) The angles of elevation and depression of the top and bottom of a lamp post from the top of a 66 m high apartment are 60° and 30° respectively. Find The height of the lamp post.

143) Three villagers A, B and C can see each other across a valley. The horizontal distance between A and B is 8 km and the horizontal distance between B and C is 12 km. The angle of depression of B from A is 20° and the angle of elevation of C from B is 30° . Calculate : the vertical height between A and B.(tan20° = 0.3640,($\sqrt{3}$ = 1.732)

144) Two ships are sailing in the sea on either side of the lighthouse. The angles of depression of two ships as observed from the top of the lighthouse are 60°

and 45° respectively. If the distance between the ships is $200\left(\frac{\sqrt{3}+1}{\sqrt{3}}\right)$ metres, find the height of the lighthouse.

145) prove that $\left(\frac{1+sin\theta-cos\theta}{1+sin\theta+cos\theta}\right)^2 = \frac{1-cos\theta}{1+cos\theta}$

146) As observed from the top of a 60 m high light house from the sea level, the angles of depression of two ships are 28° and 45°. If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships. (tan28° = 0.5317)

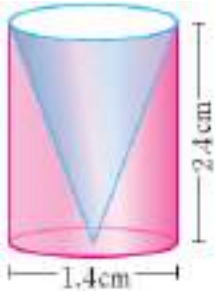
147) prove the following identities.
$(\sin\theta + \sec\theta)^2 + (\cos\theta + \operatorname{cosec}\theta)^2 = 1 + (\sec\theta + \operatorname{cosec}\theta)^2$

148) prove the following identities.
$\frac{sin^3A+cos^3A}{sinA+cosA} + \frac{sin^3A-cos^3A}{sinA-cosA} = 2$

149) if cot θ + tanθ = x and secθ - cosθ = y, then prove that $\left(x^2y\right)^{\frac{2}{3}} - \left(xy^2\right)^{\frac{2}{3}} = 1$

150) Three villagers A, B and C can see each other across a valley. The horizontal distance between A and B is 8 km and the horizontal distance between B and C is 12 km. The angle of depression of B from A is 20° and the angle of elevation of C from B is 30° . Calculate the vertical height between B and C (tan20° = 0.3640,($\sqrt{3}$=1.732)

151) From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and base is hollowed out. Find the total surface area of the remaining solid.



152) The internal and external radii of a hollow hemispherical shell are 3 m and 5 m respectively. Find the T.S.A. and C.S.A. of the shell.

153) An industrial metallic bucket is in the shape of the frustum of a right circular cone whose top and bottom diameters are 10 m and 4 m and whose height is 4 m. Find the curved and total surface area of the bucket.

154) The radius and height of a cylinder are in the ratio 5 : 7 and its curved surface area is 5500 sq.cm. Find its radius and height.

155) A solid iron cylinder has total surface area of 1848 sq.m. Its curved surface area is five – sixth of its total surface area. Find the radius and height of the iron cylinder.

156) The frustum shaped outer portion of the table lamp has to be painted including the top part. Find the total cost of painting the lamp if the cost of painting 1 sq.cm is Rs.2.

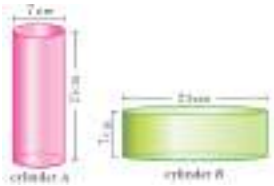
157) The volume of a cylindrical water tank is 1.078×10^6 litres. If the diameter of the tank is 7m, find its height.

158) For the cylinders A and B

(i) find out the cylinder whose volume is greater.

(ii) verify whether the cylinder with greater volume has greater total surface area.

(iii) find the ratios of the volumes of the cylinders A and B.



159) The volume of a solid hemisphere is 29106 cm^3. Another hemisphere whose volume is two-third of the above is carved out. Find the radius of the new

hemisphere.

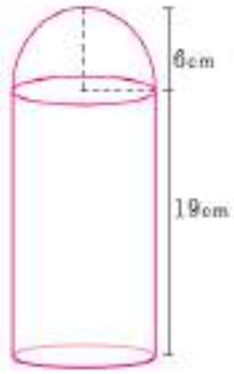
160) If the radii of the circular ends of a frustum which is 45 cm high are 28 cm and 7 cm, find the volume of the frustum.

161) A conical container is fully filled with petrol. The radius is 10 m and the height is 15 m. If the container can release the petrol through its bottom at the rate of 25 cu.meter per minute, in how many minutes the container will be emptied. Round off your answer to the nearest minute.

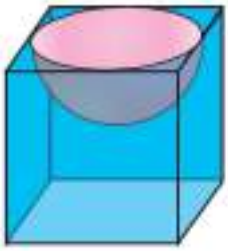
162) A right angled triangle whose sides are 6 cm, 8 cm and 10 cm is revolved about the sides containing the right angle in two ways. Find the difference in volumes of the two solids so formed.

163) The volumes of two cones of same base radius are 3600 cm^3 and 5040 cm^3. Find the ratio of heights.

164) A toy is in the shape of a cylinder surrounded by a hemisphere. The height of the toy is 25 cm. Find the total surface area of the toy if its common diameter is 12 cm.



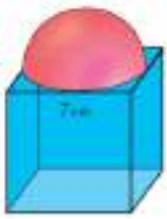
165) A hemispherical section is cut out from one face of a cubical block such that the diameter l of the hemisphere is equal to side length of the cube. Determine the surface area of the remaining solid.



166) A solid consisting of a right circular cone of height 12 cm and radius 6 cm standing on a hemisphere of radius 6 cm is placed upright in a right circular cylinder full of water such that it touches the bottom. Find the volume of the water displaced out of the cylinder, if the radius of the cylinder is 6 cm and

height is 18 cm.

167) As shown in figure a cubical block of side 7 cm is surmounted by a hemisphere. Find the surface area of the solid.



168) A metallic sphere of radius 16 cm is melted and recast into small spheres each of radius 2 cm. How many small spheres can be obtained?

169) An aluminium sphere of radius 12 cm is melted to make a cylinder of radius 8 cm. Find the height of the cylinder.

170) A solid right circular cone of diameter 14 cm and height 8 cm is melted to form a hollow sphere. If the external diameter of the sphere is 10 cm, find the internal diameter.

171) The internal and external diameter of a hollow hemispherical shell are 6 cm and 10 cm respectively. If it is melted and recast into a solid cylinder of diameter 14 cm, then find the height of the cylinder.

172) A solid sphere of radius 6 cm is melted into a hollow cylinder of uniform thickness. If the external radius of the base of the cylinder is 5 cm and its height is 32 cm, then find the thickness of the cylinder.

173) A hemi-spherical hollow bowl has material of volume $\frac{436\pi}{3}$ cubic cm. Its external diameter is 14 cm. Find its thickness.

174) The volume of a cone is $1005\frac{5}{7}$ cu. cm. The area of its base is $201\frac{1}{7}$ sq. cm. Find the slant height of the cone.

175) The marks scored by 10 students in a class test are 25, 29, 30, 33, 35, 37, 38, 40, 44, 48. Find the standard deviation.

176) Find the standard deviation of the following data 7, 4, 8, 10, 11. Add 3 to all the values then find the standard deviation for the new values.

177) Find the standard deviation of the data 2, 3, 5, 7, 8. Multiply each data by 4. Find the standard deviation of the new values.

178) 48 students were asked to write the total number of hours per week they spent on watching television. With this information find the standard deviation of hours spent for watching television.

x	6	7	8	9	10	11	12
f	3	6	9	13	8	5	4

179) Marks of the students in a particular subject of a class are given below:

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Number of students	8	12	17	14	9	7	4

Find its standard deviation.

180) The mean and standard deviation of 15 observations are found to be 10 and 5 respectively. On rechecking it was found that one of the observation with value 8 was incorrect. Calculate the correct mean and standard deviation if the correct observation value was 23?

181) Find its standard deviation, In a study about viral fever, the number of people affected in a town were noted as

Age in years	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Number of people affected	3	5	16	18	12	7	4

Find its standard deviation

182) The measurements of the diameters (in cms) of the plates prepared in a factory are given below. Find its standard deviation.

Diameter(cm)	21-24	25-28	29-32	3-6	37-40	41-44
Number of plates	15	18	20	16	8	7

183) For a group of 100 candidates the mean and standard deviation of their marks were found to be 60 and 15 respectively. Later on it was found that the scores 45 and 72 were wrongly entered as 40 and 27. Find the correct mean and standard deviation.

184) The mean and variance of seven observations are 8 and 16 respectively. If five of these are 2, 4, 10, 12 and 14, then find the remaining two observations.

185) The consumption of number of guava and orange on a particular week by a family are given below.

Number of Guavas	3	5	6	4	3	5	4
Number of Oranges	1	3	7	9	2	6	2

Which fruit is consistently consumed by the family?

186) The time taken (in minutes) to complete a homework by 8 students in a day are given by 38, 40, 47, 44, 46, 43, 49, 53. Find the coefficient of variation.

187) Two dice are rolled. Find the probability that the sum of outcomes is (i) equal to 4 (ii) greater than 10 (iii) less than 13.

188) A game of chance consists of spinning an arrow which is equally likely to come to rest pointing to one of the numbers 1, 2, 3, ...12. What is the probability that it will point to (i) 7 (ii) a prime number (iii) a composite number?

189) A bag contains 12 blue balls and x red balls. If one ball is drawn at random (i) what is the probability that it will be a red ball? (ii) If 8 more red balls are put in the bag, and if the probability of drawing a red ball will be twice that of the probability in (i), then find x.

190) Two unbiased dice are rolled once. Find the probability of getting
(i) a doublet (equal numbers on both dice)
(ii) the product as a prime number
(iii) the sum as a prime number
(iv) the sum as 1

191) Three fair coins are tossed together. Find the probability of getting
(i) all heads
(ii) atleast one tail
(iii) atmost one head
(iv) atmost two tails

192) A bag contains 5 red balls, 6 white balls, 7 green balls, 8 black balls. One ball is drawn at random from the bag. Find the probability that the ball drawn is
(i) white
(ii) black or red
(iii) not white
(iv) neither white nor black

193) The king and queen of diamonds, queen and jack of hearts, jack and king of spades are removed from a deck of 52 playing cards and then well shuffled. Now one card is drawn at random from the remaining cards. Determine the probability that the card is
(i) a clavor
(ii) a queen of red card
(iii) a king of black card.

194) If A and B are two events such P(A) = $\frac{1}{4}$, P(B) = $\frac{1}{2}$ and P(A and B) = $\frac{1}{8}$, find (i) P(A or B) (ii) P(not A and not B)

195) In a class of 50 students, 28 opted for NCC, 30 opted for NSS and 18 opted both NCC and NSS. One of the students is selected at random. Find the probability that
(i) The student opted for NCC but not NSS.
(ii) The student opted for NSS but not NCC.
(iii) The student opted for exactly one of them.

196) The probability that a person will get an electrification contract is $\frac{3}{5}$ and the probability that he will not get plumbing contract is $\frac{5}{8}$. The probability of getting atleast one contract is $\frac{5}{7}$. What is the probability that he will get both?

197) If A, B, C are any three events such that probability of B is twice as that of probability of A and probability of C is thrice as that of probability of A and if P(A ∩ B) = $\frac{1}{6}$, P(B ∩ C) = $\frac{1}{4}$, P(A ∩ C), $\frac{1}{8}$, P(A P(A U B U C) = $\frac{9}{10}$, P(A ∩ B ∩ C) = $\frac{1}{15}$, then find P(A), P(B) and P(C)?

198) If for a distribution $\Sigma(x-5) = 3, \Sigma(x-5)^2$, and total number of observations is 18, find the mean and standard deviation.

199) In a two children family, find the probability that there is at least one girl in a family.

200) The King, Queen and Jack of the suit spade are removed from a deck of 52 cards. One card is selected from the remaining cards. Find the probability of getting
(i) a diamond
(ii) a queen
(iii) a spade
(iv) a heart card bearing the number 5.

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ANNUAL MINIMUM MATERIALS GRAPH & CONSTRUCTION

10th Standard

Maths

47 x 8 = 376

1) Discuss the nature of solutions of the following quadratic equations.
$x^2 + x - 12 = 0$

2) Draw the graph of $y = 2x^2$ and hence solve $2x^2 - x - 6 = 0$

3) Draw the graph of $y = x^2 + 4x + 3$ and hence find the roots of $x^2 + x + 1 = 0$

4) Draw the graph of $y = x^2 + x - 2$ and hence solve $x^2 + x - 2 = 0$

5) Draw the graph of $y = x^2 - 4$ and hence solve $x^2 - x - 12 = 0$

6) Draw the graph of $y = x^2 - 4$ and hence solve $x^2 + 1 = 0$

7) Draw the graph of $y = x^2 + 3x + 2$ and use it to solve $x^2 + 2x + 1 = 0$

8) Draw the graph of $y = x^2 + 3x - 4$ and hence use it to solve $x^2 + 3x - 4 = 0$

9) Draw the graph of $y = x^2 - 5x - 6$ and hence solve $x^2 - 5x - 14 = 0$

10) Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$

11) Draw the graph of $y = (x - 1)(x + 3)$ and hence solve $x^2 - x - 6 = 0$

12) Discuss the nature of solutions of the following quadratic equations.
$x^2 - 8x + 16 = 0$

13) Discuss the nature of solutions of the following quadratic equations.
$x^2 + 2x + 5 = 0$

14) Graph the following quadratic equations and state their nature of solutions.
$x^2 - 4x + 4 = 0$

15) Graph the following quadratic equations and state their nature of solutions.
$x^2 + x + 7 = 0$

16) Graph the following quadratic equations and state their nature of solutions.
$x^2 - 9 = 0$

17) Graph the following quadratic equations and state their nature of solutions.
$x^2 - 6x + 9 = 0$

18) Graph the following quadratic equations and state their nature of solutions.
$(2x - 3)(x + 2) = 0$

19) A bus is travelling at a uniform speed of 50 km/hr. Draw the distance-time graph and hence find

(i) the constant of variation

(ii) how far will it travel in $\frac{1}{2}$

(iii) the time required to cover a distance of 300 km from the graph.

20) A company initially started with 40 workers to complete the work by 150 days. Later, it decided to fasten up the work increasing the number of workers as shown below.

Number of workers (x)	40	50	60	75
Number of days (y)	150	120	100	80

(i) Graph the above data and identify the type of variation.

(ii) From the graph, find the number of days required to complete the work if the company decides to opt for 120 workers?

(iii) If the work has to be completed by 200 days, how many workers are required?

21) Nishanth is the winner in a Marathon race of 12 km distance. He ran at the uniform speed of 12 km/hr and reached the destination in 1 hour. He was followed by Aradhana, Ponmozhi, Jeyanth, Sathya and Swetha with their respective speed of 6 km/hr, 4 km/hr, 3 km/hr and 2 km/hr. And, they covered the distance in 2 hrs, 3 hrs, 4 hrs and 6 hours respectively. Draw the speed-time graph and use it to find the time taken to Kaushik with his speed of 2.4 km/hr.

22) Graph the following linear function $y = \frac{1}{2}x$. Identify the constant of variation and verify it with the graph. Also

(i) find y when x = 9

(ii) find x when y = 7.5.

23) The following table shows the data about the number of pipes and the time taken to till the same tank.

No\of pipes (x)	2	3	6	9
Time Taken (in min) (y)	45	30	15	10

Draw the graph for the above data and hence

(i) find the time taken to fill the tank when five pipes are used

(ii) Find the number of pipes when the time is 9 minutes.

24) A two wheeler parking zone near bus stand charges as below

Time in hours (x)	4	8	12	24
Amount $Rs.$ (y)	60	120	180	360

Check if the amount charged are in direct variation or in inverse variation to

the parking time. Graph the data. Also
(i) find the amount to be paid when parking time is 6 hr;
(ii) find the parking duration when the amount paid is ₹150.

25) Draw the graph of $y = x^2 + x$ and hence solve $x^2 + 1 = 0$

26) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{3}{5}$ of the corresponding sides of the triangle PQR (scale factor $\frac{3}{5} < 1$)

27) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{4} > 1$)

28) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{2}{3}$ of the corresponding sides of the triangle PQR (scale factor $\frac{2}{3} < 1$).

29) Construct a triangle similar to a given triangle LMN with its sides equal to $\frac{4}{5}$ of the corresponding sides of the triangle LMN (scale factor $\frac{4}{5} < 1$).

30) Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{6}{5}$ of the corresponding sides of the triangle ABC (scale factor $\frac{6}{5} > 1$).

31) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{3}$ of thecorresponding sides of the triangle PQR (scale factor $\frac{7}{3} > 1$)

32) Draw a triangle ABC of base BC = 8 cm, $\angle A = 60^\circ$ and the bisector of $\angle A$ meets BC at D such that BD = 6 cm.

33) Construct a $\triangle PQR$ which the base PQ = 4.5 cm, $\angle R = 35^\circ$ and the median RG from R to PG is 6 cm

34) Construct a $\triangle$ PQR in which QR = 5 cm, $\angle P = 40^\circ$ and the median PG from P to QR is 4.4 cm. Find the length of the altitude from P to QR.

35) Construct a $\triangle$ PQR such that QR = 6.5 cm, $\angle P = 60^\circ$ and the altitude from P to QR is of length 4.5 cm.

36) Construct a $\triangle$ ABC such that AB = 5.5 cm, $\angle C = 25^\circ$ and the altitude from C to AB is 4 cm.

37) Draw a triangle ABC of base BC = 5.6 cm, $\angle A = 40^\circ$ and the bisector of $\angle A$ meets BC at D such that CD = 4 cm.

38) Draw $\angle PQR$ such that PQ = 6.8 cm, vertical angle is 50° and the bisector of the vertical angle meets the base at D where PD = 5.2 cm.

39) Draw a circle of radius 3 cm. Take a point P on this circle and draw a tangent at P.

40) Draw a circle of radius 4 cm. At a point L on it draw a tangent to the circle using the alternate segment.

41) Draw a circle of diameter 6 cm from a point P, which is 8 cm away from its centre. Draw the two tangents PA and PB to the circle and measure their lengths.

42) Draw a tangent at any point R on the circle of radius 3.4 cm and centre at P ?

43) Draw a circle of radius 4.5 cm. Take a point on the circle. Draw the tangent at that point using the alternate segment theorem.

44) Draw the two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also, measure the lengths of the tangents.

45) Take a point which is 11 cm away from the centre of a circle of radius 4 cm and draw the two tangents to the circle from that point.

46) Draw the two tangents from a point which is 5 cm away from the centre of a circle of diameter 6 cm. Also, measure the lengths of the tangents

47) Draw a tangent to the circle from the point P having radius 3.6 cm, and centre at O. Point P is at a distance 7.2 cm from the centre.

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