Real numbers

1. Find the H.C.F. of 900 and 270 by using Euclid division lemma.

2. Find the value of $\log_x \sqrt{x^3}$ (x>0)

3. If $2\log5 = \frac{1}{3}\log 125 = \log x$ then find the value of 'x'.

4. P.T $\sqrt{6} + \sqrt{10}$ as irrational number.

5. If the prime factorisation of 500 is $2^a \times 5^b$, then find the value of a + b.

6. Find the GCD of 15 and 21 using euclid division lemma.

7. Solve $\log_{c^2} \sqrt{c}$

8. If $x = \log_3^5$ and $y = \log_3^7$ then express $\log_3^{35}$ in terms of x and y.

9. Show that $\log a + \log \frac{1}{a} = 0$

10. Show that $3 + \sqrt{7}$ is an irrational number.

11. Can you find the H.C.F. of 0.8 and 1.28 by using Euclid division lemma ? Justify your answer.

12. $x^2 + y^2 = 6xy$ then S.T. $2\log(x+y) = \log x + \log y - 3\log2$.

13. If the G.C.D of 48, 60 is 48q - 60, then find the value of 'q'.

14. If $x = \log_3^9$ and $y = \log_2^{64}$ then find the value of $2x^2 - y$

15. If $\log_3^{81} + \log_4^{16} - \log_3^9 = \log_2^x$ then find the value of x.

16. Find the H.C.F of 135 and 225 by using euclid division algorithm

17. Show that $\sqrt{5} + 2\sqrt{3}$ is an irrational number.

18. Prove that $5\sqrt{2} - 3\sqrt{5}$ is an irrational number

19. Use euclids division lemma to show that the square of any positive integer is in the form of 7p or 7p + 1 or 7p + 2 or 7p + 4

20. Prove that $\sqrt{7} - \sqrt{5}$ is irrational number.

21. If the HCF of 98 and 280 is equal to $m^2 - 5m$ then find the positive value of m

22. Show that the square of any positive integer will be in the form of 4p or 4p + 1

23. If $\frac{1}{2}\log 25 + \log 3 - \frac{1}{3}\log 27 = \log x$ then find the value of x.

24. Prove that $3 - 2\sqrt{5}$ is an irrational.

25. Prove that $\sqrt{3} + \sqrt{7}$ is irrational number.

Sets

1. If A={$x:x=\log_3^n$, 'n' is a factor of 9} and B={$x:x \in$N, 2x+3=7} then find A∩B.

2. " n empty set is a finite set" is this statement true or false ? Why ?

3. C={All types of ⊿le }, D={Isosceles ⊿les, Equilateral ⊿les} Check whether C∩D is equal to D∩C.

4. If A = {$x:x = 5n$, n$\in$ W, $n \leq 3$ } then write A in roster form.

5. S = {$x:x = p^2-1$, $1 \leq p \leq 5$} express S into roster form.

6. Draw a venn diagram of $(A \cup B)-(A \cap B)$ where A and B are any two sets.

7. Write any two subsets of {2, 4, 6, 8}

8. A={$x:x$ is a letter in the word "FOLLOW" } and B={$x:x$ is a letter in the word "WOLF"} the Rajesh said that A⊂B, but Kiran said that B⊂A. Do you agree with them?

9. If A={ 1, 2, 3, 4} B={2, 3, 4, 6, 7} S.T $(A \cup B) - (A \cap B) = (A-B) \cup (B - A)$

10. A={$x:x$ is a factor of 10}, B={$x:x$ is a prime number less than 10} Represent sets A, B in venn diagram.

11. Represents the venn diagram

   i) A$\cup$B={$x : x \in$positive integers less than 7}

   ii) A$\cap$B ={$x : x \in$ even prime number}

   iii) A-B={$x :x \in$ first three odd numbers}

   iv) B - A={$x :x \in$ first two composite numbers}

12. From the given adjacent venn diagram. Find setA, setB A∩ B, A$\cup$B and Show that

   n(A$\cup$B) = n(A) + n(B) - n(A∩ B)

13. Find the value of $(A \cap B)$

14. Draw the venn diagram of A, B sets where $A \subset B$

15. a and b are two positive integers a > b. By euclidean division, a = bq + r. when b = 7 write the values of r in roster form

16. P = {3, 5, 7, 9}; Q = {4, 5, 6, 7, 8} find n(Q - P)

17. A = set of first five odd composite numbers. B = set of first five multiples of 9. Represent A, B through venn diagram.

18. A is a set of even numbers and B is a set of odd numbers. Draw venn diagram of $A \cap B$ and $A - B$

19. Find $A \cap B$ where A = {x:x is a natural number and foctor of 6},

    B = {x:x is a odd number lessthan 10}

20. P.T n(A∪B) =n(A - B) + n(B - A) with examples.

21. If A = {x:x∈N, x is a factor of LCM of 6, 15},

    B = {x:x∈N, x<16 and x i a multiple of HCF of 6, 15} then find $(A \cup B) - (A \cap B)$

22. A = {x² - 1: x∈N and -2≤x≤0}, B = {2x + 1: x∈W and -2< x<2} find $(A \cup B)$ and $(A \cap B)$

23. A ={ prime numbers < 10}, B = { multiples of 3 < 15}, C = $\varnothing$ show that $A - (A \cap B)$

24. If A = {1, 3, 4, 5, 6, 7} and B = {2, 3, 5, 7, 8} find $A - (A \cap B)$ and list all the subsets of $A - (A \cap B)$

Polynomials

1. Draw a rough sketch of polynomial which has three zeros.

2. Check whether -3 and 3 are the zeros of x² - 9.

3. P(x)=x³-2, find the value of P(1)+P(-1).

4. Three numbers are positive consecutive numbers. If sum of square of first number and product of 2ⁿᵈ and 3ʳᵈ number is 154. Find the numbers.

5. Find the product of zeros of the ppolynomial p(x) = x² - 1

6. In a division of polynomials Rajani got degree of r(x) is '0', then she thought g(x) is a

factor of p(x) according to division algorithem. Do you agree with her. Give an example to justify.

7.   Find the zeros of x^2+6x+8 and verify the relation between zeros and coefficients.

8.   The dimensions of a cuboid are $(x + 2)$, $(x - 1)$ and $(x - 3)$ respectively. Find the volume of cuboid.

9.   Find the quadratic polynomial whose zeros are 3 and $\dfrac{-1}{2}$

10. Find the zeroes of the polynomial $P(x) = x^2 - 4x + 3$ and verify the relationship between the zeroes and coefficients.

11. Represent $y = 2x + 5$ graphically

12. Find the zeros of the polynomial $p(x) = x^2+3x-4$ using the graph.

13. Draw the graph of $x^2 - 3x + 2$ and find its zeros.

14. Draw the graph for the polynomial $P(x) = x^2 + 3x + 2$ and find the zeroes from the graph

15. Represent the zeroes of $P(x) = x^2 - 4x + 3$ by graph

16. Divide $x^3 + 3x^2 - x - 3$ by $x^2 - 1$ and check the divisibility rule

17. Find the zeroes of the quadratic polynomial $P(x) = x^2 - 3x + 2$ by using graph

18. Verify that $\dfrac{1}{2}$, 1, -2 are the zeros of the cubic polynomila $2x^3 + x^2 - 5x + 2$ and also verify the relationship between the zeroes and the coefficients.

Linear Equations in two variables

1.   Find the coordinates of a point where $x + 2y = -7$ meets x-axis.

2.   If $4x +2y = 6$ and $-3x - y = -5$ then find the value of $x + y$.

3.   The length of $\overline{AB}$ is 3cm. If $\overline{AB}$ is produced to P, then $BP^2=AB.AP$. Write the equation to find the length of BP.

4.   Solve graphically $x - 2y = 3$, $2x + y = 4$.

5.   State whether $x^2 = (x + 1)^2 - 7$ is a quadratic equation or not? Explain with suitable reason.

6.   Find the value of 'k', so that $2x + 4y + 7 = 0$ and $10x + 20y + k = 0$ dependent linear equations

7. For which value of k, 2x - ky + 3 = 0 and 3x + 6y - 5 = 0 pair of linear equations are parallel.

8. 5 pencils, 7 pens together costs Rs. 50 whereas 7 pencils, 5 pens costs Rs. 46. Write equations for the given information.

9. Sum of two numbers is 153 and their difference is 7. Represent a linear equation in two variables and find that numbers.

10. Find the quadratic polynomial if the zeros of it are 2^0 and 2^{-1}.

11. If $P(x) = x^3 - 3x^2 + 5$ then find $P(-2)$

12. For what value of 'k', 2x + 3y + 5 = 0 and 4x + ky + 7 = 0 are parallel.

13. Solve the equations $\frac{x}{2} + \frac{y}{3} = 1, \frac{x}{3} + \frac{y}{2} = 1$ by elimination method.

14. Pinky said that the pair of linear equations x + 2y = 6 and 2x + 4y- 5 = 0 have infinite solutions. Do you agree. Give reasons.

15. In a competetive examination every right answer carries 4 marks, every wrong answer has 2 negative marks, in that exam bharathi scored 24 marks. If every right answer carries 4 marks, if every wrong has one negative marks then she scores 30 marks. Give two linear equations in two variables for above information.

13. Find the values of x, y of the equating 2x + 3y = 12 and 3x + 2y =13 using graph.

14. Draw the graph for the following linear equations and find their solutions from the graph, 3x + 4y - 7 = 0, 2x + 5y - 14 = 0.

15. Represent the solution of pair of linear equations x + 2y = 4, and 2x + 4y = 12 using graph.

16. Find the solution of the set of linear equations 3x + y = 5 and 2x - 3y + 4 = 0 graphically.

17. Solve $\frac{5}{x-1} + \frac{1}{y-2} = 2$ and $\frac{6}{x-1} + \frac{3}{y-2} = 1$

Quadratic Equations

1. Find the quadratic equation having roots as the values of $\tan 45^0 \cosec 30^0$.

2. Find the area of a rectangle whose length and breadth are the roots of quadratic equation $x^2 + 5x + 6 = 0$

3. If the roots of $ax^2 + bx + c = 0$, $a \neq 0$ are equal then show that $b^2 = 4ac$.

4. Solve $x^2 - 3x - 10$ graphically.

5. $x + \dfrac{1}{x} = 3$ is not a quadratic equation. Do you agree?

6. If $Y = ax^2 + bx + c$ (a>0), has no real roots then draw a diagram for this expression. (No need graph)

7. If $x^2 - px + 9 = 0$ has equal roots then find the value of p

8. The sides of a rectangle are $(2x + 3)$m and $(x + 2)$m. And its perimeter is 28mts. Find x.

9. A two digit number is such that the product of the digits is 35, when 18 is added to the number the digits are interchanged their places, Find the numbers.

10. The hypotenuse of right angles triangle is 6cm, more than twice the shortest side. If the third side is 2cm less than she hypotenuse. Find the sides of triangle.

11. Find the quadratic polynomial for the zeros 5, 6.

12. Explain the benfits of evaluating the discriminat of Q.E before attempting to solve it. What does its value signifies?

13. Find the roots of the quadratic equation $x - \dfrac{1}{x} = 1$ and $x \neq 0$

14. Whether the roots of $x^2 - 16 = 0$ equal or not justify.

15. The numerator of a fraction is one less than the square of denomnator, and the fraction is 8/3. Write the quadratic equation in its standard form.

16. The product of ages of sunitha 2yrs ago and 4yrs later is 16. Then find the present age of sunitha

17. Ramya bought note books and text books. Total number of books are 15. The no.of text books are 7 less than the no.of note books then find no.of note books and no.of text books using graphical method.

18. Sum of the areas of two squares is 468m². If the difference of their perimeter is 24m then find the sides of two squares.

19. Sum of two numbers is 15 and sum of their reciprocals is 3/10 then find the numbers.

20. The diagonal of a right angle triangle is 2 units more than its smallest side and the other side is 1 unit less than diagonal then find the lengths of the sides of the triangle.

21. Find the roots of $2x^2 + 5x - 3 = 0$ by the method of completing the square.

22. The hypotenuse of a right triangle 5m, more than twice of the shortest side. If the third side is 4m. less than the hypotenuse. find the side of the triangle.

Progressions

1. Write the formulae for sum to 'n' terms of an A.P. and write about each term of it.

2. In an A.P. 2nd term is 5 times the 5th term S.T 7th term is '0'.

3. Write the formula of sum of 'n' terms of A.P and explain the terms.

4. If $Cos0^0$, $Sec45^0$ and $Cosec30^0$ are in G. P then find the common ratio.

5. Is $\dfrac{1}{64}, \dfrac{1}{32}, \dfrac{1}{8}$ .... are in G. P

6. In a A.P 39th term is 51 and 51st term is 39. Find which term becomes zero of an A.P. ?

7. In a flower bed, there are 23 rose plants in the first row, 21 in the second, 19 in the third and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed.

8. If you save Rs.3 on 1st day, Rs.6 on 2nd day, Rs.9 on 3rd day, so on. Find the amount save in the month of Feb, 2018.

9. Explain the terms in the formula $a_n = ar^{n-1}$

10. Find the nth term of a progression $\dfrac{x}{2}, \dfrac{x}{4}, \dfrac{x}{8} .....$

11. 4320 is expressed as $5^p . 3^q . 2^r$. If p, q, r are in A.P then find the 15th term.

12. If a boy required 3 match sticks to prepare a triangle, 5 match sticks to prepare 2 triangles and 7 match sticks for 3 triangles then find the number of match sticks to prepare 100 triangles.

13. The 10th term and 18th terms of an A.P are 41 and 73 respectively. Find the 26th term

14. If the zeroes of the polynomial $x^3 + 15x^2 + 66x + 80$ are in A.P. Find the 10th term of that particular A.P

15. Find the sum of multiples of 7 from 100 to 1000.

16. If the sum of first 6 terms of an A. P is 36 and that of 15terms is 225, find the sum of first n terms

17. In an A.P if first term is 2, common difference is 8 and sum of 'n' terms is 90, then find the number of terms and n^{th} term

Coordinate geometry

1. Find the vertex of a triangle if two of its vertices are (1, 2), (3, 5) and the centroid is origin.

2. Explain the characterstic of a line passing through the points (-3, 7), (0, 7), (4, 7)

3. Find the centroid of Δle, Whose vertices are (2, 4), (6, 4), (2, 0).

4. In what ratio y-axis divided the segment joininig the points (7, 3) and (-4, 5)

5. If a line passing through the points (0, 4) and (-3, 1) then find the angle of the line that makes with positive direction of X - axis

6. If the slope of the line passing through the points (3, 2) and (1, x) is 2, then find x.

7. Does the line joining A(3, 2) and B(-8,2) is parallel to X - axis or not. Give reason

8. Find the centroid of triangle ABC, if A(-4, 6), B(2, 2), C(2, 5)

9. Find the slope of the line passing through the points (-2, 4) and (6, 2)

10. Are the points (3, -2), (-2, 8), (0, -4) collinear points? Why?

11. Find the trisection point of the line joining two points A(7, 2) and B(1, 5).

12. Show that vertices A(2, -2), B(14, 10), C(11, 13), D(-1, 1) can form a rectangle and find its area?

13. S.T the points A(4, 2), B(7, 5), C(9, 7) are collinear.

14. If the centroid of the triangle whose vertices are (3, -2), (2, 3) and (a, b) is (a, b). then find (a, b)

15. Find the angle made by the line joining the points A(2, 4) and B(3, 5) with the x - axis in the positive direction.

16. In $\triangle ABC$, A = (2, 3) and the mid point of BC is (-2, 4). Find the centroid of triangle.

17. Can we construct a triangle with the following points (2, 0), (1, 2) and (-1, 6)?

18. If the points (8, 1), (k, -4) and (2, -5) are collinear then find the value of k.

19. Are the given points (-3, 2), (5, 4), (7, -6) collinear? Why?

20. If area of the ∆le formed with vertices (k, k), (2, 3), (4, -1) is 10 sq. units then find the value of k.

21. Find the trisectional points of line joining (2, -2) and (-7, 4).

22. For what value of n , the points (n, -1), (2, 1) and (4, 5) are lie on the same line.

23. If the origin is the centroid of triangle whose vertices are (2, 3), (x, y) and (3, -2). Then find the area of triangle.

24. Justify the type of triangle formed by the vertices (-2, 1), (2, 1) and (-2, 5) with proper reasons.

25. Find the centroid of the triangle ABC with the following points A($\tan 45^0$, $\sin 30^0$), B($\log_3 9$, $\log_2 1$), C(2^0, 3^{-1})

26. Name the type of quadrilateral formed, by the following points and give reasons for your answer. (4, 5), (7, 6), (4, 3) and (1, 2)

27. Find the coordinates of the points of trisection of the segment joining (5, 7) and (3, -4).

28. Find the ratio in which the point (-3, p) divides the line segment joining the points (-5, -4) and (-2, 3). Hence find the value of 'p'.

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ALL THE BEST