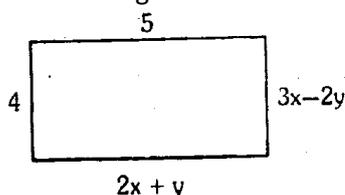


LINEAR EQUATIONS IN TWO VARIABLES

- Q1 The value of a and b for which the pair of linear equations $2x+3y-7$ and $2ax+(a+b)y=28$ has infinitely many solutions are:
a) 3 and 5 b) 4 and 5 c) 4 and 7 d) 4 and 8
- Q2 The value of k for which the pair of linear equations $10x+5y-(k-5)=0$ and $20x+10y-k=0$ has infinitely many solution.
a) 2 b) 5 c) 10 d) 80
- Q3 If $x=a, y=b$ is the solution of the pair of linear equations $x-y=5$ and $4x-3y=17$, then the values of a and b are
a) $a=-3, b=3$ b) $a=2, b=-3$ c) $a=-2, b=3$ d) $a=3, b=-2$
- Q4 The pair $x+2y=140$ and $3x+4y=360$ of linear equations represents two lines which are
a) Parallel b) intersecting c) coincident d) either intersecting or parallel
- Q5 If the lines represented by the pair of linear equations $4x+ky-8=0$ and $3x-5y+7=0$ are parallel then the value of k is
a) $-\frac{3}{20}$ b) $-\frac{20}{3}$ c) $-\frac{10}{5}$ d) $\frac{20}{3}$
- Q6 For what value of k the system of equations $2x+(k-2)y=k$ and $6x+(2k-1)y=2k+5$ has infinite solutions?
- Q7 Find a and b for which the following pairs of linear equations has infinite solutions
a) $2x-(a-4)y=2b+1$ b) $2x+3y=7$
 $4x-(a-1)y=5b-1$ $2ax+(a+b)y=28$
- Q8 For what values of k the pair of linear equations have no solution?
a) $3x-1y=k$ b) $8x+5y=9$
 $(2k-1)x+(k+2)y=2k+1$ $kx+10y=8$
- Q9 Solve graphically
a) $3x-4y=1$ b) $x-2y=5$
 $6x-8y=-4$ $2x-4y=10$
c) $3x+y=11, x-y=1$ and $x=0$. Also find the area of triangle formed
d) $2y-x=8, 5y-x=14, y-x=1$. Write the coordinates of vertices of the triangle formed by the lines representing these equations
- Q10 The area of a rectangle gets reduced by 9 square units if its length is reduced by 5 units and the breadth is increased by 3 units. If we increase length by 3 units and breadth by 2 units, the area is increased by 67sq. Units. Find the length and breadth.
- Q11 A boat covers 32km upstream and 36km downstream in 7 hours. Also it covers 40km upstream and 48k downstream in 9 hours. Find the speed of the boat in still water and that of the stream.
- Q12 The ratio of incomes of two persons is 9:7 and the ratio of their expenditure is 4:3. If each of them manages to save ₹2,000 per month, find their monthly incomes.
- Q13 Find the values of x and y if ABCD is a rectangle.



- Q14 A and B each have certain number of oranges. A says to B, "If you give me 10 of your oranges, I will have twice the number of oranges left with you." B replies "If you give me 10 of your oranges, I will have the same number of oranges as left with you." Find the number of oranges with A and B separately.
- Q15 Ram travels 760km to his home, partly by train and partly by car. He takes 8 hours if he travels 160km by train and the rest by car. He takes 12 minutes more if he travels 240km by train and the rest by car. Find the speed of the train and the car separately.
- Q16 A two digit number is obtained by either multiplying sum of digits by 8 and adding 1 or by multiplying the difference of the digits by 13 and adding 2. Find the numbers.
- Q17 In an examination, 2 marks are awarded for each correct answer while 1 mark is deducted for each wrong answer. Ram answered 150 questions and got 240 marks. How many questions did he answer correctly?
- Q18 The sum of a two-digit number and the number obtained by reversing the order of its digit is 165. If the digits differ by 3, find the number.
- Q19 Solve the following pair of equations
- | | |
|--|---|
| a) $\frac{10}{x+y} + \frac{2}{x-y} = 4$ | $\frac{15}{x+y} - \frac{5}{x-y} = -2$ |
| b) $47x + 31y = 63$ | $31x + 47y = 15$ |
| c) $\frac{5}{x} + \frac{1}{y} = 2; x \neq 0, y \neq 0$ | $\frac{6}{x} - \frac{3}{y} = 1$ |
| d) $\frac{5}{x} - 2y = \frac{17}{3}; x \neq 0$ | $\frac{2}{x} + 3y = \frac{-16}{3}$ |
| e) $\frac{6}{x+y} + \frac{3}{x-y} = 3$ | $\frac{1}{2(x+y)} - \frac{1}{3(x-y)} = 2$ |
| f) $\frac{x}{3} - \frac{y}{4} = 1$ | $\frac{x}{8} + \frac{y}{3} = \frac{25}{12}$ |
- Q20 Solve $2x + 3y = 11$, $2x - 4y = -24$. Hence find the value of m for which $y = mx + 3$

POLYNOMIALS

- Q1 Verify that -2 , $+1$, $+\frac{1}{2}$ are zeroes of the polynomial $P(x)=2x^3+1x^2-5x+2$. Also verify the relationship between the zeroes and the coefficients of $P(x)$
- Q2 Form the quadratic polynomial with zeroes
 a) 3 and $-\frac{3}{4}$ b) $\frac{2}{5}$ and $-\frac{2}{5}$ c) $\sqrt{2}$ and 3 d) $\frac{1}{2}$ and 2
- Q3 Find the value of b for which the polynomial $2x^3 + 9x^2 - x - b$ is exactly divisible by $2x + 3$
- Q4 If two zeroes of the polynomial $P(x) = x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 + \sqrt{3}$ and $2 - \sqrt{3}$ find other zeroes.
- Q5 Write the sum and products of zeroes of polynomial without finding the zeroes.
 $P(x) = 6x^3 + 5x^2 - 12x + 4$
- Q6 If sum of squares of zeros of polynomial $P(x) = x^2 - 8x + k$ is 40 , find the value of k .
- Q7 Give examples of polynomials $f(x)$, $g(x)$, $q(x)$ and $r(x)$ which satisfy division algorithm and (i) degree $r(x) < 0$ (ii) degree $q(x) = \text{degree } r(x) = 1$
- Q8 If polynomial $x^4 - 6x^2 + 16x^2 - 25x + 10$ is divided by $x^2 - 2x + k$, the remainder is $x + a$, find k and a .
- Q9 Find the value of P for which the polynomial $x^3 + 4x^2 - px + 8$ is exactly divisible by $x - 2$.
- Q10 Find the quotient and remainder in the division of the 1st polynomial by 2nd polynomial.
 a) $27x^3 - 1$ by $3x - 1$ b) $x^3 - 3x^2 + 3x - 5$ by $x^2 - x + 1$
- Q11 Is $x^2 + 5x + 6$ a factor of $x^3 - 19x - 30$?
- Q12 If a and b are zeroes of the polynomial $f(x) = x^2 - 5x + k$ and $a - b = 1$, find k .
- Q13 In dividing $P(x) = x^2 + 3x + 2$ by a polynomial $g(x)$ the quotient $q(x)$ and remainder are $x - 2$ and 12 . Find $g(x)$.
- Q14 On dividing $6x^4 + 8x^3 + 17x^2 + 21x + 7$ by $3x^2 + 4x + 1$ the remainder is $px + q$. Find p and q .
- Q15 If α and β are zeroes of polynomial $p(x) = 4x^2 - 5x - 1$, find the value of
 a) $\alpha^2 + \beta^2$ b) $\alpha^2\beta + \beta^2\alpha$
- Q16 If α and β are zeroes of polynomial $p(x) = x^2 - 2x + 3$, find the value of
 a) $\alpha + 2, \beta + 2$ b) $\frac{1}{\alpha}, \frac{1}{\beta}$
- Q17 If HCF and LCM of $p(x)$ and $q(x)$ are $2x - 1$ and $6x^3 + 25x^2 - 24x + 5$ respectively, if $p(x) = 2x^2 + 9x - 5$ find $q(x)$.
- Q18 Find zeroes of polynomial: $px^2 + (q^2 - pr)x - qr$ and verify relationship between zeroes and coefficients.

Mathematics Project / PowerPoint Presentation

Class X

Students to do any one of the following using the given guidelines:

1. Decimal system and other systems (Binary, Hexadecimal)
 - a) Harappan period
 - b) History related to other civilisations
 - c) Uses
 - d) Properties
 - e) Interesting facts, quotes, puzzles related to decimal system

2. Pi (π)
 - a) Aryabhata's use of π
 - b) Value of π - calculations by different mathematicians
 - c) π as an irrational number
 - d) Uses in formulae
 - e) Activity – calculations of π by using circle cut outs (minimum 8 of different radii)

3. Pythagoras Theorem
 - a) Baudhayana's Sutra
 - b) Pythagoras and his works
 - c) Pythagoras theorem
 - i) Geometric proof using squares
 - ii) Bhaskaracharya's proof and other proofs
 - d) Formula to generate Pythagorean triplets
 - e) Uses and interesting problems
 - f) Extensions
 - g) Converse of Pythagoras theorem

4. Vedic Mathematics
 - a) History
 - b) Methods of faster calculation
 - i) Multiplication
 - ii) Division
 - iii) Squares and square rootswith examples in each case

5. Geometry in Architecture
 - a) Stability of a triangle in comparison of other figures
 - b) Buildings and monuments involving combination of solid figures
 - c) Present day buildings

6. Prime numbers
 - a) What are prime numbers?
 - b) Properties
 - c) Large prime numbers
 - d) Is there a formula for generating prime numbers

7. Frequency of letters or words in a language test. Draw graph to represent the data.
(Consider a paragraph from newspaper)

8. Magic squares, mathematical crosswords, Sudoku and other puzzles with examples.