

Worksheet on Polynomials

Class 10

1. A zero of the polynomial $2x^2 + x + K$ is 3. Find value of K
2. If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by $(x^2 - 2x + k)$ the remainder comes out to be $x + a$, find k and a.
3. Manish engages a labour to get some repair work. Charges to be paid for this work are zeroes of the polynomial $x^2 - 300x + 22500$.
 - (a) Find zeroes of this polynomial
 - (b) Labour claims Rs. 125 for the whole work. Manish paid the actual amount. What value is depicted by Manish ?
4. Check whether $g(x)$ is a factor of $p(x)$ by applying the division algorithm.
 $p(x) = 2x^5 - 4x^3 + 2x^2 + 5x + 1$, $g(x) = x^3 - 4x + 1$
5. Form a quadratic polynomial whose zeroes are $\frac{3-\sqrt{3}}{5}$ and $\frac{3+\sqrt{3}}{5}$
6. If α and β are zeroes of the polynomial $x^2 + 7x + 7$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$
7. Find the zeroes of the following polynomials by factorization method and verify the relationship between the zeroes and coefficients of the polynomial
 - (a) $4x^2 + 5\sqrt{2}x - 3$
 - (b) $2x^2 - (1 + 2\sqrt{2})x + \sqrt{2}$
 - (c) $v^2 + 4\sqrt{3}v - 15$
 - (d) $7y^2 - \frac{11}{3}y - \frac{2}{3}$
8. If one zero of the polynomial $(a^2 + 9)x^2 + 13x + 6a$ is reciprocal of the other, find the value of a.
9. If the zeroes of the polynomial $x^2 + px + q$ are double of the zeroes of $2x^2 - 5x - 3$, find value of p and q.
10. If α and β are the zeroes of the polynomial $f(x) = px^2 + qx + r$, the evaluate

$$\frac{1}{p\alpha+q} + \frac{1}{p\beta+q}$$

Worksheet On Linear Equations

Class 10

1. For which values of p and q , will the following pair of linear equations have infinitely many solutions ?

$$4x + 5y = 2,$$
$$(2p + 7q)x + (p + 8q)y = 2q - p + 1$$

2. Solve by elimination method : $11x + 15y + 23 = 0$; $7x - 2y - 20 = 0$
3. Equation $2x = 5y + 4$ is given. Write another linear equation so that the lines represented by the pair are (i) intersecting (ii) coincident (iii) parallel
4. Determine algebraically, the vertices of the triangle formed by the lines $3x - y = 3$, $2x - 3y = 2$, $x + 2y = 8$
5. Solve graphically the pair of equations $2x + y = 6$ and $2x - y + 2 = 0$. Find the ratio of the areas of the two triangles formed by the lines representing these equations with X-axis and the lines with Y-axis.
6. Solve the system of following equations :

$$7^x + 5^y = 74$$
$$7^{x+1} - 5^{y+1} = 218$$

7. Solve by cross multiplication method :

$$\frac{27}{x+y} - \frac{15}{x-y} = -2,$$

$$\frac{30}{x+y} - \frac{1}{x-y} = 1$$

8. The sum of a two-digit number and number obtained by reversing the order of digits is 99. If the digits of the number differ by 3, then find the numbers.
9. Solve by elimination method : $8x + 5y = 9$, $3x + 2y = 4$
10. Father's age is 3 times the sum of ages of his two children. After 5 yrs, his age will be twice the sum of ages of the two children. Find the age of the father.

Revision Question on Triangles

Class – X

1. In a Δ triangle ABC, $DE \parallel BC$. If $DE = \frac{2}{3} BC$ and area of $\Delta ABC = 81$ sq cm find the area of ΔADE
2. P is the mid point of side BC of ΔABC . Q is the mid point of AP, BQ when produced meets AC at L. Prove that $AL = \frac{1}{3} AC$
3. Prove that three times the sum of the squares of the sides of a triangle is equal to four times the sum of the medians of the triangle.
4. If the diagonal of a trapezium divides the other diagonal in the ratio 1:3 prove that one of the parallel sides is three times the other.
5. In an isosceles triangle ΔABC , the base AB is produced both ways to P and Q such that $AP \times BQ = (AC)^2$. Prove that $\Delta ACP \sim \Delta BCQ$
6. In a ΔPQR , $PQ = PR$, X is a point on PR such that $QR^2 = PR \times XR$. Prove that $QX = QR$
7. If the areas of two similar triangles are equal prove that they are congruent.
8. ABC is a right angled triangle right angled at B. AD and CE are two medians drawn from A and C respectively. $AC = 5$ cm and $AD = \frac{3\sqrt{5}}{2}$ cm. Find the length of CE.
9. If A is the area of a right angled triangle and b is one of the sides containing right angle. Prove that the length of the altitude on the hypotenuse $\frac{2 A b}{\sqrt{b^4 + 4A^2}}$
10. In ΔPQR $XY \parallel QR$, $PX = 1$ cm, $XQ = 3$ cm, $YR = 4.5$ cm $QR = 9$ cm, find PY and XY. If the area of ΔPXY is $A \text{ cm}^2$, find area of ΔPQR and area of trapezium XYRQ in terms of A.
11. In ΔABC , XY is parallel to BC and it divides ΔABC into two parts of equal area. Prove that

$$\frac{BX}{AB} = \frac{\sqrt{2}-1}{\sqrt{2}}$$

