{DAV Sr. Sec. Public School} ASSIGNMENTS (SUMMER VACATION) JRD

Class - X (Maths), SESSION - (2023-24)

Q(1): P and Q are two positive integers such that $P = p^3q$ and $Q = (pq)^2$ where p and q are prime numbers, find the LCM(P, Q) and HCF(P, Q).

(2) If $xy = 180$ and HCF$(x, y) = 3$, then find the LCM(x, y).

(3) Find the sum of exponents of prime factors in the prime factorisation of 196.

(4) Find the LCM of smallest two digit composite number and smallest composite number.

(5) The HCF and LCM of two numbers are 9 and 360 respectively. If one number is 45, find the other number.

(6) Explain whether $3 \times 12 \times 101 + 4$ is a prime number or a composite number.

(7) Find the HCF and LCM of 90 and 144 by the method of prime factorisation.

(8) check whether 4^n can ends with the digit 0 for any natural number n.

(9) If HCF of 144 and 180 is expressed in the form of $13m - 16$, find the value of m.

(10) Show that $2\sqrt{3} + 7$ is an ir-rational number.

(11) Prove that $2 - \sqrt{3}$ is ir-rational given that $\sqrt{3}$ is ir-rational.

(12) Prove that $\frac{2+\sqrt{3}}{5}$ is ir-rational.

(13) Find the zeroes of the polynomial $15x^2 - x - 6$ and verify the relationship.

(14) Find the zeroes of $5\sqrt{5}x^2 + 30x + 8\sqrt{5}$.

(15) Find a quadratic polynomial where zeroes are $5 - 3\sqrt{2}$ and $5 + 3\sqrt{2}$.

(16) Find a quadratic polynomial, the sum and product of whose zeroes are (-3) and 2 respectively.

(17) If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then find the value of k.

(18) If α and β are the zeroes of the polynomial $p(x) = 4x^2 + 4x - 1$ then find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$.

(19) If one zero of the polynomial $p(x) = (a^2+4)x^2 + 13x + 4a$ is reciprocal of the other, then find the value of a.

(20) If α and β are the zeroes of the polynomial $p(x) = 2x^2 - 7x + 3$, then find the value of $\alpha^2 + \beta^2$.

(21) If α and β are zeroes of the polynomial $3x^2 - 2x - 7$, then find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$.

(22) If α and β are the zeroes of the polynomial $p(x) = x^2 - px - (p+c)$, then find the value of $(\alpha+1)(\beta+1)$.

(23) For what value of k, the pair of equations
$x - 2y = 3$ and $-3x + ky = -9$ have infinitely many solns.

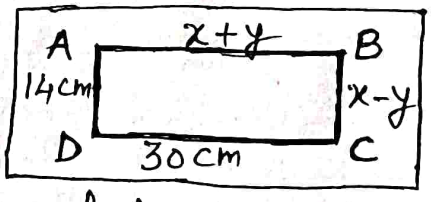
(24) For what value of m and n the following system of linear equations have infinitely many solutions?
$3x + 4y = 12$ and $(m+n)x + 2(m-n)y = 5m - 1$.

(25) Solve graphically the pair of linear equations
$3x - 4y + 3 = 0$ and $3x + 4y - 21 = 0$.
Find the co-ordinates of the vertices of the triangular region formed by these lines and x-axis. Also calculate the area of this triangle.

(26) Solve the following pair of linear equations by substitution method. $3x + 2y - 7 = 0$ and $4x + y - 6 = 0$.

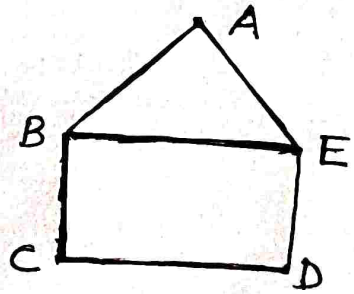
(27) Seven times a two digit number is equal to four times the number obtained by reversing the order of its digits. If the difference of the digits is 3, determine the number.

(28) In the given figure ABCD is a rectangle. Find the value of x and y.



(29) Seven times a two digit number is equal to four times the number obtained by reversing the order of its digits. If the difference of the digits is 3, find the number.

(30) In the given figure, ABCD is a pentagon with BE ∥ CD and BC ∥ DE. BC is perpendicular to CD. AE = AB = 5 cm, BE = 7 cm, BC = $x - y$ and CD = $x + y$. If the perimeter of ABCD is 27 cm, find the value of x and y.



Case Based Questions

(1) John and Jivanti are playing with marbles in the playground. They together have 45 marbles and John has 15 marbles more than Jivanti.
Read the above text and answer the following questions:
(I) How many marbles Jivanti had ?
(II) How many marbles John had ?
(III) If 45 is replaced by 55 in the above case, then find the number of marbles Jivanti have.
(IV) The given problem is based on which mathematical concept.

(2) A parabolic shape object used for receiving signals from a satellite, especially television signals. A signal is produced or reflected from a focal point. A parabola is the graph that results from $p(x) = ax^2 + bx + c$.
If the values of a, b and c are 1, -3 and 2 respectively, then give answer of following questions :
(I) Find the zeroes of polynomial $p(x)$.
(II) If α and β are zeroes of $p(x) = x^2 - 3x + 2$, then find the value of $\alpha^2 + \beta^2 - \frac{1}{\alpha\beta}$.
(III) If one zero of the quadratic polynomial $x^2 + kx + 2$ is 1, then what is the value of k.
(IV) Find the quadratic polynomial whose zeroes are 5 and -3.

(3) A seminar is being conducted by an Educational organisation where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.
(I) In each room the same number of participants are to be seated, hence maximum number of participants that can accomodated in each room are if all of them being in the same subject.
(II) What is the minimum number of rooms required during the event.
(III) The LCM of 60, 84 and 108 is .
(IV) 108 can be expressed as a product of primes, find it.