AL KHOZAMA INTERNATIONAL SCHOOL,DAMMAM

Affiliated to CBSE – New Delhi, No:5730019

CLASS 09 - MATHEMATICS

Worksheet-Term -1

Section A

1. Rationalise the denominator of $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$
2. Simplify: $\left(3^4\right)^{\frac{1}{4}}$.
3. Express the decimal $2.\overline{93}$ in the form $\frac{p}{q}$, where p, q are integers and q ≠ 0.
4. Write the coefficient of x in $\frac{3}{8}x^2 - \frac{2}{7}x + \frac{1}{6}$
5. Factorise: $21x^2 + 5x - 6$.
6. Plot the point on the graph paper: (0, -4)
7. On which axis point (–5, 0) lie?
8. On which axis does the point (7,0) lie?
9. Write the equation in the form ax + by + c = 0 and indicate the values of a, b, c in case: 5y = 4
10. Write as an equation in two variables: $y = \frac{3}{2}x$
11. How many solutions does the equation 2x + 5y = 8 has?

Section B

12. Simplify: $7^{\frac{1}{2}} \cdot 8^{\frac{1}{2}}$
13. Is zero a rational number? Can you write it in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$?
14. Factorise: $9x^2 - 12x + 3$
15. Factorize: $8a^3 - b^3 - 4ax + 2bx$
16. Give possible expression for the length and breadth of the rectangle whose area is given by $4a^2 + 4a - 3$.
17. Give the geometric representation of 2x + 9 = 0 as an equation in two variables.
18. Find the co-ordinate where the linear equation $4x - \frac{2}{3}y = 7$ meets at y-axis.

Section C

19. Rationalise the denominator: $\frac{1}{\sqrt{7}+\sqrt{6}-\sqrt{13}}$
20. If $x = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, and $y = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$, then find the value of $x^2 + y^2$.
21. Simplify the following by rationalizing the denominator : $\frac{\sqrt{5}-2}{\sqrt{5}+2} - \frac{\sqrt{5}+2}{\sqrt{5}-2}$
22. Factorize: $xy^9 - yx^9$
23. Expand $\left(x - \frac{2}{3}y\right)^3$
24. If x + 1 is a factor of $ax^3 + x^2 - 2x + 4a - 9$, find the value of a.
25. The three vertices of a square ABCD are A(3, 2), B (-2, 2) and D (-3, 3). Plot these points on a graph paper and hence, find the coordinates of C. Also, find the area of square ABCD.

26. Write the answer of each of the following questions:
    i. What is the name of horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane?
    ii. What is the name of each part of the plane formed by these two lines?
    iii. Write the name of the point where these two lines intersect.
27. Locate the points (A) (-3, 4) (B) (3, 4) and (C) (0, 0) in a Cartesian plane write the name of figure which is formed by joining them.
28. Find at least 3 solutions for the following linear equation in two variables: x + y – 4 = 0
29. Draw the graph of the equation, 2x + y = 6.
    Find the coordinates of the point where the graph cuts the x-axis.
30. Find at least 3 solutions for the following linear equation in two variables:
    2x + 3y = 4
31. Draw the graph of the following linear equation: 2y + 5 = 0

Section D

32. If $a = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $b = \frac{\sqrt{2}-1}{\sqrt{2}+1}$, then find the value of $a^2 + b^2 - 4ab$.
33. Represent each of the numbers $\sqrt{2}, \sqrt{3}$ and $\sqrt{5}$ on the real line.
34. Simplify: $\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}} - \frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}} - \frac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}}$.
35. If x = 0 and x = -1 are the zeros of the polynomial $f(x) = 2x^3 - 3x^2 + ax + b$, find the value of a and b.
36. Using factor theorem, factorize the polynomial: $x^3 + 2x^2 – x – 2$
37. Verify that $x^3 + y^3 + z^3 - 3xyz$
    $= \frac{1}{2}(x+y+z)\left[(x-y)^2 + (y-z)^2 + (z-x)^2\right]$
38. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body, express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units. Also from the graph read the work done when the distance travelled by the body is:
    i. 2 units
    ii. 0 units
39. Draw the graph of the equation 2x + 3y = 11. From your graph, find the value of y when
    a. x = 7
    b. x = - 8
40. If the cost of a pen and a pencil be “x” and “y” respectively. A girl pays Rs.16 for buying 2 pens and 3 pencils. Write the given data in the form of a linear equation in two variables. Also represent the same graphically.