MATHS HOLIDAY HOMEWORK

CLASS – IX

NOTE: Solve the worksheet in A4 size ruled sheets.

1. Evaluate: $\sqrt{27\,a^3b^2c^4} \times \sqrt[3]{128\,a^7b^9c^2} \times \sqrt[6]{729\,ab^{12}c^2}$.

2. Express the following in the form of p/q.

(i) $0.\overline{621}$ (ii) $0.\overline{37}$

3. Simplify : $0.\overline{4} + .01\overline{8}$

4. Simply : $5\sqrt[3]{250} + 7\sqrt[3]{16} - 14\sqrt[3]{54}$ (ii) $\left(\frac{81}{16}\right)^{-3/4} \times \left[\left(\frac{25}{9}\right)^{-3/2} \div \left(\frac{5}{2}\right)^{-3}\right]$

5. If $\frac{3+2\sqrt{2}}{3-\sqrt{2}} = a + b\sqrt{2}$, where a and b are rational then find the values of a and b.

6. If $\sqrt{5}$ = 2.236 and $\sqrt{2}$ = 1.414, then

Evaluate : $\frac{3}{\sqrt{5}+\sqrt{2}} + \frac{4}{\sqrt{5}-\sqrt{2}}$

7. If x = 3 - $\sqrt{8}$, find the value of $x^3 + \frac{1}{x^3}$.

8. Simplify :

(i) $\frac{(25)^{3/2} \times (243)^{3/5}}{(16)^{5/4} \times (8)^{4/3}}$ (ii) $\frac{16 \times 2^{n+1} - 4 \times 2^n}{16 \times 2^{n+2} - 2 \times 2^{n+2}}$

9. Prove that : $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5.$

10. If $x^2 + \frac{1}{x^2}$ = 23, find the value of $\left(x + \frac{1}{x}\right)$.

11. Evaluate : (i) $(1005)^3$ (ii) $(997)^3$

12. If $x = \frac{4}{3}$ is a root of the polynomial $f(x) = 6x^3 - 11x^2 + kx - 20$ then find the value of k.

13. The polynomials $ax^3 + 3x^2 - 13$ and $2x^3 - 5x + a$ are divided by x + 2 if the remainder in each case is the same, find the value of a.

14. Factorise by splitting the middle term : $x^2 - 14x + 24$.

15. If $f(x) = 2x^3 - 13x^2 + 17x + 12$ then find out the value of f(-2) & f(3).

16. Factorise : $x^3 + 13x^2 + 32x + 20$.

17. Plot the following points on the graph paper.

(i) A(2 ,5) (ii) B(-5,-7) (iii) C(3,-2) (iv) D (0,5) (v) E(5,0)

18. Plot the points O(0,0), A(4,0) and C(0,6). Find the coordinates of the fourth points B such the OABC forms a rectangle.

19. Simplify: $(2p + s - t)^2 - (2p - s + t)^2$

20. If $x + y = 10$ and $xy = 25$, find the value of $x^3 + y^3$

21. Factorise : $8y^3 - 125z^3$

22. Find five solutions of the following equation: $2x - y = -3$

23. The taxi fare in a city for the first kilometer is Rs 10 and for the subsequent distance it is Rs 6 per kilometer . Taking the distance covered as x kilometer and total fare as Rs y. Write a linear equation for this information and draw its graph. Also, find the fare for travelling a distance of 4 km.

24. What must be subtracted from $x^3 - 6x^2 - 15x + 80$ so that the result is exactly divisible by $x^2 + x - 12$

25. Find the value of a & b : $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a - b\sqrt{3}$

26. Find the reminder when $P(x) = x^3+4x^2-3x+10$ is divided by $(x+4)$ by using remainder theorem.

27. The polynomial $f(x) = x^3+15x^2 + 9x - a$ when divided by $(x+4)$ leaves a remainder -80, find the value of 'a'.

28. Show that $(x-\sqrt{2})$ is a factor of $7x^2 - 2\sqrt{8}x - 6$

29. (i) Plot of the points A(1, 4.5), B(-1,0), C(1, - 4.5) and D(3,0) on a graph paper,

(ii) Name the figure ABCD (iii) Find the area of ABCD

30. Give the geometric representation of $4x = -2$ as an equation in (i) one variable (ii) two variables

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