



INDIAN SCHOOL AL WADI AL KABIR

DEPT. OF MATHEMATICS 2015 - 2016

Class IX – Holiday Home Work

1. Insert three rational numbers between $\frac{3}{5}$ and $\frac{5}{7}$.
2. If $\left(\frac{8}{15}\right)^3 - \left(\frac{1}{3}\right)^3 - \left(\frac{1}{5}\right)^3 = \frac{x}{75}$, find x .
3. If $a = 9 - 4\sqrt{5}$, find the value of $a^2 - \frac{1}{a^2}$.
- 4). If $x = 3 + 2\sqrt{2}$, find the value of $x^2 + \frac{1}{x^2}$.
5. Represent $\sqrt{3.5}$ on the number line.
- 6). Represent $\sqrt{7}$ on the number line.
7. Factorise : $\frac{1}{8}a^3 + \frac{1}{4}a^2b + \frac{1}{6}ab^2 + \frac{1}{27}b^3$
- 8). Factorise : $4x^3 + 12x^2 - x - 3$
9. Find the value of $x^3 + y^3 + 15xy - 125$, when $x + y = 5$.
10. If $a + b + c = 6$, find $(2 - a)^3 + (2 - b)^3 + (2 - c)^3 - 3(2 - a)(2 - b)(2 - c)$.
11. If $(x - 3)$ and $(x - \frac{1}{3})$ are both factors of $ax^2 + 5x + b$, show that $a = b$.
12. If $\frac{(\sqrt{5} + \sqrt{3})}{\sqrt{5} - \sqrt{3}} + \frac{7(\sqrt{5} - 2\sqrt{3})}{\sqrt{5} + 2\sqrt{3}} = a - \sqrt{15}b$, find the values of a and b .
13. Simplify :
$$\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{25}{9}\right)^{-\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]$$
14. Let p and q be the remainders, when the polynomials $x^3 + 2x^2 - 5ax - 7$ and $x^3 + ax^2 - 12x + 6$ are divided by $(x + 1)$ and $(x - 2)$ respectively. If $2p + q = 6$, find the value of a .
15. If $x + \frac{y}{2} = 9$ and $xy = 4$ find $x^3 + \frac{y^3}{8}$.
16. Prove that :
$$(x + y)^3 + (y + z)^3 + (z + x)^3 - 3(x + y)(y + z)(z + x) = 2(x^3 + y^3 + z^3 - 3xyz)$$
17. Find the product of $5\sqrt{2}(3 + \sqrt{2})(5 + \sqrt{2})$.

18. Find the remainder when $2x^2 - x + 1$ is divided by $2x + 1$.
19. Evaluate : $(\sqrt{5} + \sqrt{2})^2 - (\sqrt{8} - \sqrt{3})^2$
20. If $x = 8 - 4\sqrt{3}$, find the value of $x^2 + \frac{256}{x^2}$.
21. If $2^x \times 4^x = (8)^{\frac{1}{3}} \times (32)^{\frac{1}{5}}$, find the value of x .
22. Without actually calculating the cubes, find the value of $(8)^3 + (-15)^3 + (7)^3$.
23. Evaluate : $\frac{4}{(216)^{\frac{-2}{3}}} + \frac{1}{(256)^{\frac{-3}{4}}} + \frac{2}{(243)^{\frac{-1}{5}}}$
24. If $(a + b + c) = 15$, $(ab + bc + ca) = 35$ find $a^2 + b^2 + c^2$.
25. If $x = 5 + 3\sqrt{3}$ find $x^2 + \frac{1}{x^2}$.
26. If $a + 8\sqrt{5}b = \frac{8 + \sqrt{5}}{8 - \sqrt{5}} - \frac{8 - \sqrt{5}}{8 + \sqrt{5}}$, determine the rational numbers a and b .
27. If $\frac{3 + \sqrt{7}}{3 - 4\sqrt{7}} = a + b\sqrt{7}$, where a and b are rational numbers, find a and b .
28. Factorise : $5(2a + b)^2 - (2a + b) - 4$
29. Simplify : $(3x - 2y)^3 - (3x + 2y)^3$
30. Factorise : $x^3 - 8x^2 + 5x + 14$
31. Evaluate : $\frac{1}{3} (\sqrt{7})^6 \times (25)^{\frac{3}{2}} \times \left(\frac{1}{5^3}\right)$
32. Factorise : $a^2 - (b - c)^2$
33. Check using factor theorem that $(2x + 1)$ is a factor of $x^3 - 2x^2 + x - 1$ or not?
34. Express $4.\overline{035}$ in the form of $\frac{p}{q}$ where p and q are integers and $q \neq 0$.
35. Polynomials $3x^3 - 5x^2 + kx - 2$ and $-x^3 - x^2 + 7x + k$ leave the same remainder when divided by $x + 2$. Find the value of k .