Grade 9 : MATH

NUMBER SYSTEM

WEEK - 1

1. Find the value of $\sqrt{12} \times \sqrt{8}$
2. Write the decimal form of $\frac{56}{1000}$.
3. Write the decimal form of $\frac{3}{11}$
4. Write the value of $\frac{1}{\sqrt{5}-\sqrt{4}}$
5. Find a rational number between – 6 and 10.
6. Find the value of $\frac{2^{o}+7^{o}}{5^{o}}$
7. Find the value of $\sqrt{(3)^{-2}}$
8. Identify an irrational number among the following number. $7.\bar{5}$, $\sqrt{7}$, $\frac{6}{7}$, $\sqrt{0.04}$
9. Express 1.8181……. in the form of $\frac{p}{q}$, where p and q are integers and q ≠ 0.
10. Find two rational numbers between 3 and 4.
11. Find 4 rational numbers between $\frac{1}{3}$ and $\frac{4}{5}$.
12. Find four rational numbers between $\frac{3}{7}$ and $\frac{5}{7}$.

WEEK - 2

13. Check whether $7\sqrt{5}$, $\frac{7}{\sqrt{5}}$, $\sqrt{2}+21$, $\pi - 5$ are irrational numbers or not.
14. If $\sqrt{2}$ = 1.414, find the value of $\frac{1}{\sqrt{2}+1}$
15. Simplify : $\sqrt{2}(\sqrt{6}-\sqrt{8})+\sqrt{3}(\sqrt{27}-\sqrt{6})$
16. Simplify : $5\sqrt{8}+2\sqrt{32}-2\sqrt{2}$

17. Write in the simplest form : $8\sqrt{45}+2\sqrt{50}-3\sqrt{147}$

18. Evaluate : $(\sqrt{5}+2\sqrt{2})^2-(\sqrt{5}-\sqrt{8})^2$

19. Simplify : $(4\sqrt{3}-3\sqrt{5})^2$

20. If x = 1 + $\sqrt{2}$, find the value of $x^2+\frac{1}{x^2}$

21. If x = 3 + $2\sqrt{2}$ find the value of $x^2+\frac{1}{x^2}$

22. If a = 8 + 3$\sqrt{7}$ and b = $\frac{1}{a}$ what will be the value of $a^2 + b^2$?

23. Find the value of $\left[x-\frac{1}{x}\right]^3$ if x = 1 + $\sqrt{2}$

24. If p = $\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and q = $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ find $p^2 + q^2$.

WEEK - 3

25. If a = $\frac{\sqrt{2}+1}{\sqrt{2}-1}$ and b = $\frac{1}{a}$, find the value of $a^2 + b^2$.

26. If x = $\frac{\sqrt{5}+1}{\sqrt{5}-1}$ and y = $\frac{\sqrt{5}-1}{\sqrt{5}+1}$, find the value of $x^2 + xy + y^2$.

27. Simplify : $\frac{\sqrt{5}-2}{\sqrt{5}+2}-\frac{\sqrt{5}+2}{\sqrt{5}-2}$

28. Find the values of a and b, if (i) $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}} = a + b\sqrt{6}$ (ii) $\frac{2+5\sqrt{7}}{2-5\sqrt{7}} = a + \sqrt{7}b$

(iii) $\frac{\sqrt{7}-1}{\sqrt{7}+1}+\frac{\sqrt{7}+1}{\sqrt{7}-1} = a + b\sqrt{7}$ (iv) $\frac{2\sqrt{6}-\sqrt{5}}{3\sqrt{5}-2\sqrt{6}} = a+b\sqrt{30}$

(v) $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}} = a\square b\sqrt{6}$

29. Simplify : $\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{2}{\sqrt{3}+\sqrt{5}}$

30. Simplify : $\frac{6}{2\sqrt{3}-\sqrt{6}}+\frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}-\frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}}$

31. Simplify : $\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{8\sqrt{3}}{\sqrt{6}+\sqrt{2}}$

WEEK - 4

32. Represent geometrically on number line.

(i) $\sqrt{3}$ (ii) $\sqrt{5.4}$ (iii) $\sqrt{7.5}$ (iv) $\sqrt{5.8}$

33. Simplify : (i) $17^2 \cdot 17^5$ (ii) $(5^2)^7$ (iii) $\frac{23^{10}}{23^7}$ (iv) $7^3, 9^3$

34. Simplify : (i) $17^2 \cdot 17^{-5}$ (ii) $(5^2)^{-7}$ (iii) $\frac{23^{-10}}{23^7}$ (iv) $7^{-3} \cdot 7^3$

35. Simplify : (i) $2^{2/3} : 2^{1/3}$ (ii) $\left[3\frac{1}{5}\right]^4$ (iii) $\frac{7^{1/5}}{7^{1/3}}$ (iv) $13^{1/5} \cdot 17^{1/5}$

36. Evaluate $\left[-\frac{1}{27}\right]^{\frac{-2}{3}}$

37. Simplify : $\left[\frac{15\frac{1}{3}}{9\frac{1}{4}}\right]^{-6}$

38. Find the value of $\left[\frac{-27}{64}\right]^{-\frac{2}{3}}$

39. Evaluate $125^{-1/3}\left[125^{1/3} - 125^{2/3}\right]$

40. Evaluate $\frac{3\sqrt{2}.4^{3/2}}{128^{1/3}}$

WEEK - 5

41. Simplify : $3\sqrt[3]{40} - 4\sqrt[3]{320} - 3\sqrt{5}$

42. Find the value of : $\frac{4}{(216)^{-\frac{2}{3}}} - \frac{1}{(256)^{-\frac{3}{4}}}$

43. Simplify : $\frac{(25)^{\frac{3}{2}} \times (343)^{\frac{1}{5}}}{16^{\frac{5}{4}} \times \frac{4}{8^3} \times 7^{\frac{3}{5}}}$

44. Evaluate : $\dfrac{\left(\frac{9}{4}\right)^{-3/2} \times \left(\frac{125}{27}\right)^{-2/3} \times \left(\frac{3}{5}\right)^{-2}}{\left(\sqrt{2}\right)^{4}}$

45. Evaluate : $\left(\frac{64}{125}\right)^{-2/3} + \dfrac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}} + \dfrac{\sqrt{25}}{3\sqrt{64}}$

46. If x = $\dfrac{\sqrt{7}}{5}$ and $\dfrac{5}{x} = p\sqrt{7}$ Find the value of P.

47. Find x if $2^4 \times 2^5 = \left(2^5\right)^x$

48. If $\left(\frac{3}{4}\right)^6 \times \left(\frac{16}{9}\right)^5 = \left(\frac{4}{3}\right)^{x+2}$ find x.

49. If $(4)^{2x-1} - (16)^{x-1} = 384$ find x.

50. If $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{2x-8}$ find x.

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