Class-IX CHAPTER – 1 Number System (Maths Assignment)

1. Represent the following irrational numbers on number line.

   (i) $\sqrt{10}$ (ii) $\sqrt{17}$ (iii) $2+\sqrt{2}$

2. Represent geometrically $\sqrt{8.1}$ on number line.

3. Write the following numbers in p/q form   (i) $2.0\overline{15}$ (ii) $0.\overline{235}$ Ans $\left(\dfrac{399}{198},\dfrac{235}{999}\right)$

4. Find two rational numbers and two irrational numbers between $\sqrt{2}$ and $\sqrt{3}$.

5. Simplify (i) $2\sqrt{50}+3\sqrt{32}+4\sqrt{18}$ Ans($34\sqrt{2}$)

   (ii) $\sqrt[4]{16} - 6\sqrt[3]{343} +18\times\sqrt[5]{243} -\sqrt{196}$ Ans(0)

   (iii) $\sqrt[4]{81} -8\sqrt[3]{216}+15\sqrt[5]{32} +\sqrt{225}$ Ans(0)

6. If x=3+2 $\sqrt{2}$, Check whether $x+\dfrac{1}{x}$ is rational or irrational.   Ans (rational)

7. Rationalise the denominator

   (i) $\dfrac{4\sqrt{3}+5\sqrt{2}}{4\sqrt{3}+3\sqrt{2}}$ Ans $\dfrac{9+4\sqrt{6}}{15}$

   (ii) $\dfrac{\sqrt{2}}{\sqrt{2}+\sqrt{3}-\sqrt{5}}$ Ans $\dfrac{\sqrt{6}+3+\sqrt{15}}{6}$

8. If x =2 + $\sqrt{3}$, find $\left(x+\dfrac{1}{x}\right)^3$ Ans(64)

9. Simplify : $\dfrac{\sqrt{6}}{\sqrt{2}+\sqrt{3}}+\dfrac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}}-\dfrac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}$ Ans(0)

10. Simplify : $\dfrac{\sqrt{72}}{5\sqrt{72}+3\sqrt{288}-2\sqrt{648}}$ Ans($\dfrac{1}{5}$)

11. Evaluate $\dfrac{15}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}}$ Ans (5.398)

    if $\sqrt{5}$ =2.236 and $\sqrt{10}$ =3.162

12. Find a and b if $\dfrac{7+3\sqrt{5}}{3+\sqrt{5}}-\dfrac{7-3\sqrt{5}}{3-\sqrt{5}}=a+b\sqrt{5}$ Ans(a=0,b=1)

13. If $\sqrt{18-6\sqrt{5}} = \sqrt{a} - \sqrt{b}$, then prove that a+b=18.

14. Simplify: $\left(\dfrac{x^b}{x^c}\right)^{b+c-a}\times\left(\dfrac{x^c}{x^a}\right)^{c+a-b}\times\left(\dfrac{x^a}{x^b}\right)^{a+b-c}$ Ans (1)

15. Prove that $\left(x^{a-b}\right)^{a+b}\cdot\left(x^{b-c}\right)^{b+c}\cdot\left(x^{c-a}\right)^{c+a} = 1$

16. Prove that : $\dfrac{a^{-1}}{a^{-1}+b^{-1}}+\dfrac{a^{-1}}{a^{-1}-b^{-1}}=\dfrac{2b^2}{b^2-a^2}$

17. If $5^{2x-1}-(25)^{x-1}= 2500$, find x $\qquad$ Ans(x=3)

18. If $2^x=5^y=10^z$, then prove that $\dfrac{1}{x} + \dfrac{1}{y} = \dfrac{1}{z}$

19. Write $\sqrt[3]{4}, \sqrt{3}, \sqrt[4]{6}$ in ascending order. $\qquad$ Ans ($\sqrt[4]{6} < \sqrt[3]{4} < \sqrt{3}$)

20. If $x=5-2\sqrt{6}$, find $x^2 + \dfrac{1}{x^2}$ $\qquad$ Ans (98)

21. Simplify: $\sqrt[4]{\sqrt[3]{x^2}}$ in exponential form $\qquad$ Ans $x^{\frac{1}{6}}$

22. If x, y, z are positive real numbers and p, q, r are natural numbers such that

$X^p=y^q=z^r$ and $\dfrac{y}{x} = \dfrac{z}{y}$, then prove that $\dfrac{2}{q} = \dfrac{1}{p} + \dfrac{1}{r}$