TOPIC: NUMBER SYSTEM **CLASS: IX**

SUBJECT: MATHEMATICS

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1. Visualize 3.756 on the number line, using successive magnification
2. Represent $\sqrt{3.5}$ on the number line
3. If $x = 3+2\sqrt{2}$, find the value of $x^2 + 1/x^2$ (34)
4. If $x = 2 + \sqrt{5}$, Prove that $x^2 + \frac{1}{x^2} = 18$
5. Express $1.\overline{3}\,\overline{2} + 0.\overline{35}$ as a fraction in simplest form. (166/99)
6. Rationalise the denominator $\frac{1}{\sqrt{6} + \sqrt{5} - \sqrt{11}}$
7. If a and b are rational numbers, find a and b

   a) $\frac{\sqrt{2} + \sqrt{3}}{3\sqrt{2} - 2\sqrt{3}} = a + b\sqrt{6}$ (a=2, b=5/6)

   b) $\frac{\sqrt{5} - 2}{\sqrt{5} + 2} - \frac{\sqrt{5} + 2}{\sqrt{5} - 2} = a + b\sqrt{5}$ (a = 0, b = - 8)
8. Simplify: a) $\frac{1}{1 + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \frac{1}{\sqrt{3} + \sqrt{4}}$ (1)
9. If $a = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3} - \sqrt{2}}$ and $b = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$, find the value of $a^2 + b^2$ (98)
10. If $a = 9 - 4\sqrt{5}$, find the value of $\left[a - 1/a\right]^2$ (320)
11. If $x = 1 - \sqrt{2}$, find the value of $\left[x - 1/x\right]^3$ (8)
12. If $x = 3 + 2\sqrt{2}$, find the value of $\left[\sqrt{x} - \frac{1}{\sqrt{x}}\right]$ (8)
13. If $x = 0.125$, find the value of $(1/x)^{1/3}$
14. If $x = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ then find the value of x^2 $(49 + 20\sqrt{6})$
15. If $x = \frac{1}{2 - \sqrt{3}}$, find the value of $x^3 - 2x^2 - 7x + 5$ (3)
16. Find four rational numbers between 3/5 and 4/5
17. Find two irrational numbers lying between $\sqrt{2}$ and $\sqrt{3}$
18. Find two rational and irrational numbers between 0.3101 and 0.3222
19. Simplify the following: a) $\left[\frac{576}{625}\right]^{-1/2}$ b) $\left[\frac{343}{1000}\right]^{-1/3}$ c) $(-1/27)^{-2/3}$ d) $(0.008)^{4/3}$ e) $(729)^{-1/6}$
20. Simplify and express the result in the simplest form: $\frac{(25)^{3/2} \times (243)^{2/5}}{(16)^{5/4} \times (8)^{4/3}}$ (1125/512)
21. Find the value x, if $5^{x-3} \times 3^{2x-8} = 225$ (x = 5)
22. Solve: a) $49 \times 7^x = (343)^{1/3}$ (x = -1)

    b) $2^x = (128)^{1/7} \times (\sqrt{2})^4$ (3)

    c) If $3^x = \frac{9}{27^x}$, find x (1/2)

    d) $(1/7)^{4-2x} = \sqrt{7}$ (9/4)
23. Evaluate: a) $125^{-1/3} \times 27^{1/3} (6^2 + 8^2)^{1/2}$ (6)

    b) $(17^2 - 8^2)^{1/2}$ (15)

    c) $64^{1/3} (64^{1/3} - 64^{2/3})$
24. Simplify: a) $\sqrt{45} + \sqrt{80} - 3\sqrt{20}$ $(\sqrt{5})$

    b) $7\sqrt{6} - \sqrt{252} - \sqrt{294} + 6\sqrt{7}$ (0)

    c) $4\sqrt{28} + 3\sqrt{7}$
25. Give an example of two irrational numbers whose: (A) Sum is rational (B) product is rational (C) quotient is rational