

FATHER AGNEL SCHOOL, NOIDA

Class IX/ Chapt. 1. Number System

1. Find two irrational numbers between $\frac{1}{7}$ and $\frac{1}{5}$

2. Simplify $\frac{7\sqrt{3}}{\sqrt{10+\sqrt{3}}} - \frac{2\sqrt{5}}{\sqrt{6+\sqrt{5}}} - \frac{3\sqrt{2}}{\sqrt{15+3\sqrt{2}}}$

3. Express the following in the form of a rational number

$$\frac{(0.6)^0 - (0.1)^{-1}}{\left(\frac{3}{8}\right)^{-1} \left(\frac{3}{2}\right)^3 + \left(-\frac{1}{3}\right)^{-1}}$$

4. Express $1.\overline{32} + 0.\overline{35}$ as a fraction in simplest form.

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

6. Find the value x, if $5^{x-3} \times 3^{2x-8} = 225$

7. Evaluate:

- a) $125^{-1/3} \times 27^{1/3} (6^2 + 8^2)^{1/2}$
- b) $(17^2 - 8^2)^{1/2}$
- c) $64^{1/3} (64^{1/3} - 64^{2/3})$

8. If $a^m \cdot a^n = a^{mn}$, then find $m(n-2) + n(m-2)$

9. If $2^a = 3^b = 6^c$, prove that $c = \frac{ab}{a+b}$

10. If $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $y = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find the value of $x^2 + y^2 + xy$.

11. Show that $\frac{x^{a(b-c)}}{x^{b(a-c)}} \div \left(\frac{x^b}{x^a}\right)^c = 1$

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

13. If a and b are rational numbers, find a and b : $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}} = a + b\sqrt{6}$