

General instructions for students: whatever be the notes provided, everything must be copied in the Maths copy and then do the HOME WORK in the same copy.

MATHS

3. EXPANSIONS (PART- II)

STD. IX

More Applications of Special Products:

EXERCISE – 3.2

22. If $a + \frac{1}{a} = p$, Prove that $a^3 + \frac{1}{a^3} = p(p^2 - 3)$.

Given: $a + \frac{1}{a} = p$ (I)

$\Rightarrow \left(a + \frac{1}{a}\right)^3 = p^3$ **Cubing both sides**

$\Rightarrow a^3 + \frac{1}{a^3} + 3(a)\left(\frac{1}{a}\right)\left(a + \frac{1}{a}\right) = p^3$

$\Rightarrow a^3 + \frac{1}{a^3} + 3p = p^3$ **Using (I)**

$\Rightarrow a^3 + \frac{1}{a^3} = p^3 - 3p$

$\Rightarrow a^3 + \frac{1}{a^3} = p(p^2 - 3)$ **Proved**

29. If $\left(x + \frac{1}{x}\right)^2 = 3$, find the value of $x^3 + \frac{1}{x^3}$

Given: $\left(x + \frac{1}{x}\right)^2 = 3 \Rightarrow x + \frac{1}{x} = \pm\sqrt{3}$ (I)

Now $\left(x + \frac{1}{x}\right)^2 = 3$

$\Rightarrow x^2 + \frac{1}{x^2} + 2 = 3$

$\Rightarrow x^2 + \frac{1}{x^2} = 3 - 2$

$\Rightarrow x^2 + \frac{1}{x^2} = 1$ (II)

$x^3 + \frac{1}{x^3} = \left(x + \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2} - 1\right)$

$= (\pm\sqrt{3})(1 - 1)$ **Using (I) and (II)**

$= (\pm\sqrt{3})(0)$

$= 0$ **Ans.**

