

Algebra (असंगणित)

$$5 + 3 = 8$$

$$3 + 5 = 8$$

$$(a+b)^2 \Rightarrow (a+b)(a+b)$$

$$a^2 + \underline{ab} + \underline{ab} + b^2$$

$$x^2 \Rightarrow x \times x$$

$$x^3 \Rightarrow x \times x \times x$$

$$(a+b)^2 \Rightarrow$$

$$a^2 + 2ab + b^2$$

$$x^4 \Rightarrow x \times x \times x \times x$$

$$a^2 + b^2 + 2ab$$

$$\frac{x^4}{x^3} = \boxed{x} \Rightarrow \frac{\cancel{x} \times \cancel{x} \times \cancel{x} \times \cancel{x}}{\cancel{x} \times \cancel{x} \times \cancel{x}}$$

$$\textcircled{1} (a+b)^2 = a^2 + b^2 + 2ab$$

$$\textcircled{2} (a-b)^2 = a^2 + b^2 - 2ab$$

$$\textcircled{3} (a^2 - b^2) \Rightarrow (a+b)(a-b)$$

$$\textcircled{4} (a+b)^3 \Rightarrow a^3 + b^3 + 3ab(a+b)$$

$$a^3 + b^3 + 3a^2b + 3b^2a$$

$$\textcircled{5} (a-b)^3 = a^3 + b^3 - 3ab(a-b)$$

$$a^3 + b^3 - 3a^2b + 3ba^2$$

$$\left(x + \frac{1}{x}\right)^2 \Rightarrow x^2 + \frac{1}{x^2} + 2 \times \cancel{x} \times \frac{1}{\cancel{x}}$$

$$\left(x - \frac{1}{x}\right)^2 \Rightarrow x^2 + \frac{1}{x^2} - 2 \times \cancel{x} \times \frac{1}{\cancel{x}}$$

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

$$\left(x + \frac{1}{x}\right)^3 = x^3 + \frac{1}{x^3} + 3 \times \cancel{x} \times \frac{1}{\cancel{x}} \left(x + \frac{1}{x}\right)$$

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

$$(a+b)^2 = a^2 + b^2 + 2ab$$

$$a^2 + b^2 = (a+b)^2 - 2ab$$

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

$$(a-b)^2 = a^2 + b^2 - 2ab$$

$$a^2 + b^2 = (a-b)^2 + 2ab$$

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

$$(a^2 - b^2) = (a+b)(a-b)$$

$$(a^2 - b^2) = (a+b)(a-b)$$

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

$$(a+b)^3 = a^3 + b^3 + 3ab(a+b)$$

$$a^3 + b^3 = (a+b)^3 - 3ab(a+b)$$

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

$$(a-b)^3 = a^3 - b^3 - 3ab(a-b)$$

$$a^3 - b^3 = (a-b)^3 + 3ab(a-b)$$

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

$$\textcircled{A} \quad x^2 + \frac{1}{x^2} = \left(x + \frac{1}{x}\right)^2 - 2 = ? \quad a^2 - 2$$

$$\Rightarrow 3^2 - 2 = 9 - 2 = 7 \text{ Ans}$$

$$x + \frac{1}{x} = 3$$

$$x + \frac{1}{x} = a$$

$$\textcircled{B} \quad x^2 + \frac{1}{x^2} = \left(x - \frac{1}{x}\right)^2 + 2 = ? \Rightarrow a^2 + 2 \Rightarrow$$

$$\Rightarrow (\sqrt{5})^2 + 2 \Rightarrow 7 \text{ Ans}$$

$$x + \frac{1}{x} = a$$

$$\textcircled{C} \quad x^2 - \frac{1}{x^2} = \left(x + \frac{1}{x}\right) \left(x - \frac{1}{x}\right) = ? \quad x - \frac{1}{x} = \sqrt{9-4} \Rightarrow \boxed{\sqrt{5}}$$

$$\Rightarrow \boxed{3 \times \sqrt{5}}$$

$$x - \frac{1}{x} = \sqrt{a^2 - 4}$$

$$\textcircled{D} \quad x^3 + \frac{1}{x^3} = \left(x + \frac{1}{x}\right)^3 - 3\left(x + \frac{1}{x}\right) = ? \quad a^3 - 3ab$$

$$\Rightarrow 3^3 - 3 \times 3 = 18 \text{ Ans}$$

$$x - \frac{1}{x} = a$$

$$x + \frac{1}{x} = \sqrt{a^2 + 4}$$

$$\textcircled{E} \quad x^3 - \frac{1}{x^3} = \left(x - \frac{1}{x}\right)^3 + 3\left(x - \frac{1}{x}\right) = ? \quad a^3 + 3ab$$

$$\Rightarrow 5\sqrt{5} + 3\sqrt{5}$$

$$(\sqrt{5})^3 + 3\sqrt{5} \Rightarrow \underline{8\sqrt{5}}$$

$$x + \frac{1}{x} = a$$

$$x - \frac{1}{x} = \sqrt{a^2 - 4}$$

$$x + \frac{1}{x} = 4$$

$$x - \frac{1}{x} = \sqrt{4^2 - 4}$$
$$\sqrt{16 - 4}$$
$$\Rightarrow \sqrt{12} \text{ Am}$$

$$x - \frac{1}{x} = a$$

$$x + \frac{1}{x} = \sqrt{a^2 + 4}$$

$$x - \frac{1}{x} = 4$$

$$x + \frac{1}{x} = \sqrt{4^2 + 4}$$
$$\sqrt{16 + 4} \Rightarrow \sqrt{20} \text{ Am}$$

2

$$x + \frac{1}{x} = a$$

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

$$x - \frac{1}{x} = a$$

$$x^2 + \frac{1}{x^2} = a^2 + 2$$

Q.3

$$x + \frac{1}{x} = 5 \checkmark$$

$$\begin{aligned} x^2 + \frac{1}{x^2} &= (5)^2 - 2 \\ &\Rightarrow 25 - 2 \\ &\Rightarrow 23 \text{ Ans} \end{aligned}$$

Q.4

$$x - \frac{1}{x} = 5$$

$$\begin{aligned} x^2 + \frac{1}{x^2} &= (5)^2 + 2 \\ &\Rightarrow 25 + 2 \\ &\Rightarrow \underline{27} \text{ Ans} \end{aligned}$$

3

$$x + \frac{1}{x} = a$$

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

$$\Rightarrow \underline{\underline{3 \times \sqrt{5} \text{ Ans}}}$$

Q.5

$$x + \frac{1}{x} = 3$$

$$x - \frac{1}{x} = \sqrt{9-4} \Rightarrow \sqrt{5}$$

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

$$3 \times \sqrt{5} \text{ Ans}$$

$$x - \frac{1}{x} = a$$

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

$$\underline{\underline{3 \times \sqrt{13} \text{ Ans}}}$$

Q.6

$$x - \frac{1}{x} = 3$$

$$x + \frac{1}{x} = \sqrt{9+4} \Rightarrow \sqrt{13}$$

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

$$\underline{\underline{3 \times \sqrt{13} \text{ Ans}}}$$

4

$$x + \frac{1}{x} = a$$

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

$$x - \frac{1}{x} = a$$

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

Q.1

$$x^3 + \frac{1}{x^3} = (3)^3 - 3 \times 3$$

$$\Rightarrow 27 - 9$$

$$\Rightarrow 18$$

$x + \frac{1}{x} = 3 \Rightarrow 18 \text{ Ans}$

Q.8

$$x^3 - \frac{1}{x^3} \Rightarrow (3)^3 + 3 \times 3$$

$$\Rightarrow 27 + 9 \Rightarrow 36$$

$$x - \frac{1}{x} \Rightarrow 3$$

Ans

$$x + \frac{1}{x} = a$$

$$x^4 + \frac{1}{x^4} = ?$$

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

Q.9 $x + \frac{1}{x} = 3$

$$x^4 + \frac{1}{x^4} = ?$$

$$x + \frac{1}{x} = 3$$

$$x^4 + \frac{1}{x^4} = ?$$

$$x^2 + \frac{1}{x^2} = 7$$

$$x^4 + \frac{1}{x^4} = 49 - 2$$

$$\Rightarrow \underline{\underline{47}} \text{ Ans}$$

$$x - \frac{1}{x} = 3$$

$$x^4 - \frac{1}{x^4} = ?$$

$$x + \frac{1}{x} = \sqrt{13}$$

$$x^2 + \frac{1}{x^2} = 11$$

$$x - \frac{1}{x} = a$$

$$x^4 - \frac{1}{x^4} = ?$$

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

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

$$11 \times 3 \times \sqrt{13}$$

$$= \underline{\underline{33\sqrt{13}}} \text{ Ans}$$

$$x + \frac{1}{x} = a$$

$$x - \frac{1}{x} = \sqrt{a^2 - 4}$$

Q.11
 $x + \frac{1}{x} = 5$

$$x - \frac{1}{x} = ?$$

$$x - \frac{1}{x} = a$$

$$x + \frac{1}{x} = \sqrt{a^2 + 4}$$

Q.12
 $x - \frac{1}{x} = 5$

$$x + \frac{1}{x} = ?$$

$$x + \frac{1}{x} = 5$$

$$x + \frac{1}{x} = a$$

$$x^2 + \frac{1}{x^2} = a^2 - 2, \quad x^2 + \frac{1}{x^2} = a^2 + 2$$

Q.13
 $x + \frac{1}{x} = 5$

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

Q.14
 $x - \frac{1}{x} = 5$

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

$$x - \frac{1}{x} = a$$

$$x^2 + \frac{1}{x^2} = a^2 + 2$$

$$x + \frac{1}{x} = a$$

$$x^2 - \frac{1}{x^2} = ?$$

$$\left(x + \frac{1}{x}\right)\left(x - \frac{1}{x}\right)$$

Q.15
 $x + \frac{1}{x} = 5$

$$x^2 - \frac{1}{x^2} = ?$$