Algebra (बीजगणित)

$5+3=8$

$3+5=8$

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

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

$x^2 \Rightarrow x \times x$

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

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

$(a+b)^2 \Rightarrow \boxed{a^2+2ab+b^2}$

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

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

① $(a+b)^2 = a^2+b^2+2ab$

② $(a-b)^2 = a^2+b^2-2ab$

③ $(a^2-b^2) \Rightarrow (a+b)(a-b)$

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

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

⑤ $(a-b)^3 = a^3+b^3-3ab(a-b)$

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

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

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

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

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

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

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

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

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

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

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

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

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

$\Rightarrow 3^2 - 2 = 9 - 2 = 7$ Ans

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

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

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

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

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

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

$\Rightarrow 3^3 - 3 \times 3 \Rightarrow 18$ Ans

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

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

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