

# LAWS OF EXPONENTS

Terminology:  $ax^n$  where

a: Coefficient

x: Base

n: Exponent or Power

$$x^a \cdot x^b = x^{a+b}$$

ex)

$$x^2 \cdot x^3 = xx \cdot xxx = x^5$$

$$x^2 \cdot x^3 = x^{2+3} = x^5$$

$$(x^a)^b = x^{a \cdot b}$$

ex)

$$(x^2)^3 = x^2 \cdot x^2 \cdot x^2 = x^{2+2+2} = x^6$$

$$(x^2)^3 = x^{2 \cdot 3} = x^6$$

$$\frac{x^a}{x^b} = \begin{cases} x^{a-b} & \text{for } a \geq b \\ \frac{1}{x^{b-a}} & \text{for } b > a \end{cases}$$

$$\text{ex)} \quad \frac{x^5}{x^2} = \frac{\cancel{x} \cancel{x} xxx}{\cancel{x} \cancel{x}} = x^3$$

$$\frac{x^5}{x^2} = x^{5-2} = x^3$$

$$\text{ex)} \quad \frac{x^2}{x^5} = \frac{\cancel{x} \cancel{x}}{\cancel{x} \cancel{x} xxx} = \frac{1}{x^3}$$

$$\frac{x^2}{x^5} = \frac{1}{x^{5-2}} = \frac{1}{x^3}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

ex)

$$\left(\frac{3}{4}\right)^2 = \frac{3}{4} \cdot \frac{3}{4} = \frac{3^2}{4^2} = \frac{9}{16}$$