

THE LAWS OF EXPONENTS

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

Examples

1

$$x^2 \cdot x^3$$

$$x \cdot x \cdot x \cdot x \cdot x$$
$$\boxed{x^5}$$

2

$$3xy^5 \cdot 2x^2y^3$$

$$3x^1y^5 \cdot 2x^2y^3$$
$$\boxed{6x^3y^8}$$

2) $\frac{x^a}{x^b} = x^{a-b}$

Examples

1

$$\frac{x^5}{x^2} = \frac{x \cdot x \cdot x \cdot x \cdot x}{x \cdot x} = \boxed{x^3}$$

2

$$\frac{-8z^5}{-2z} = \frac{-8z^5}{-2z^1} = \boxed{4z^4}$$

3) $(x^a)^b = x^{ab}$

Example

1

$$(x^3)^4 = x^3 \cdot x^3 \cdot x^3 \cdot x^3 = x^{3+3+3+3} = \boxed{x^{12}}$$

4)

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

Example

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

$$\frac{a^2}{a^5} = \frac{a \cdot a}{a \cdot a \cdot a \cdot a \cdot a} = \frac{1}{a^3}$$

5)

$$x^0 = 1$$

Examples

$$1 \quad \frac{x^5}{x^5} = x^{5-5} = x^0 = 1$$

$$\frac{x^5}{x^5} = \frac{x \cdot x \cdot x \cdot x \cdot x}{x \cdot x \cdot x \cdot x \cdot x} = 1$$

2

$$3x^0 = 3(x^0) = 3(1) = 3$$