

Exponent Properties

Power

a ← exponent
 b
↑
base

What is the base and exponent

$$-2^3$$

base 2

exponent 3

Write in exponential form

base $\frac{1}{2}$

exponent 4

$$\left(\frac{1}{2}\right)^4 \neq \frac{1}{2^4}$$

↑ ↑
need
()

$$\frac{1^4}{2}$$

Expanded Form

$$3^{\textcircled{2}} \cdot 3^{\textcircled{4}}$$

$$3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$$

$$3^6 \leftarrow 2+4$$

Product of powers with the same base

$$2^6 \cdot 3^1 \neq$$

$$6^{10}$$

Cannot combine.
They do not have the same base.

$$\downarrow$$
$$64 \cdot 3$$

$$192$$

$$60, 466, 176$$

$$3x^2x^5(2xy)$$

means

$$3 \cdot x^2 \cdot x^5 \cdot 2 \cdot x^1 \cdot y^1$$

$$6x^8y$$

$$(4\underline{x^2} \underline{z^3})(\underline{z^2}y)$$

$$4x^2z^5y$$

Power of a Power

$$(x^2)^3$$

base $\frac{x^2}{.}$
exponent 4

Expand

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

$$x^8 \leftarrow 2 \cdot 4$$

$$(z^2)^3 (z^2)$$

$$z^6 \cdot z^2$$

$$z^8$$

$$(3x)^2$$

Power of a product

exponent
2 is applied to each
factor

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

$$9x^2$$

$$(x^2)^3 \quad (xy^3)^3$$

$$x^6$$

$$x^3$$

$$(y^3)^3$$

$$x^6$$

$$x^3$$

$$y^9$$

$$x^9 y^9$$