

Exponent Rules

After you solve these, come up with some **rules** that you discover about how to take a power to a power.

$$(x \cdot x \cdot x)^4 \rightarrow (x \cdot x \cdot x)(x \cdot x \cdot x)(x \cdot x \cdot x)(x \cdot x \cdot x)$$

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

$$(a^5)^2 \rightarrow a^5 \cdot a^5 \rightarrow a^{10}$$

$$(p^1)^6 \rightarrow p^6$$

$$(m^5 n^2)^3 = (m^5 n^2)(m^5 n^2)(m^5 n^2) = m^{15} n^6$$

$$\left(\frac{b^4}{c^3}\right)^4 = \frac{b^{16}}{c^{12}}$$

Taking a Power to a Power:

Keep the base • multiply the exponents

Example:

$$1. (x^2)^5 = x^{10}$$

$$2. (a^4 b)^2 = a^8 b^2$$

$$3. (2m^3)^4 = (2 \cdot m \cdot m \cdot m)(2 \cdot m \cdot m \cdot m)(2 \cdot m \cdot m \cdot m)(2 \cdot m \cdot m \cdot m) = 16m^{12}$$

$$4. \left(\frac{5g^{50}}{6h^{30}}\right)^2 = \frac{25g^{100}}{36h^{60}}$$

$$5. -2(m^3)^{-5} = -2m^{-15} \rightarrow -2 \cdot \frac{1}{m^{15}} \rightarrow \frac{-2}{m^{15}}$$

Now it's your

Example:

$$1. (-2y)^3 \text{ and } -(2y)^3$$

$$-2y \cdot -2y \cdot -2y = -8y^3$$

$$-(2y)(2y)(2y) = -8y^3$$

$$2. (-3g^{-4})^2 = 9g^{-8} = \frac{9}{g^8}$$

$$3. 2(m^3)^{-4}(x^2)^2 = 2m^{-12}x^4 = \frac{2x^4}{m^{12}}$$

$$4. (x^2 y^3)^2 (x^3 y^2)^{-2} = x^4 y^6 x^{-6} y^{-4} = x^{-2} y^2$$

$$5. 2a^2 b^3 (a^3 b^2)^{-2} = 2a^2 b^3 a^{-6} b^{-4} = 2a^{-4} b^{-1} = \frac{2}{a^4 b}$$

turn...

1. $(3x^4)^5$

2. $(16a^2b^2c)^2$

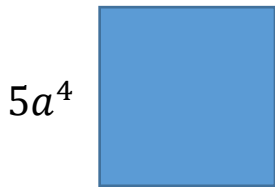
3. $\left(\frac{2m^{-3}}{v}\right)^{-4}$

4. $\left(\frac{4g^{50}}{8g^{30}}\right)^2$ Hint: Simplify a bit inside the parentheses first.

$\frac{g^{40}}{4}$

Real World:

1.) Find the perimeter and area of the square:



2.) Manny has four pieces of carpet. Each piece is in the shape of a square like the one shown: He is going to put these four pieces together in a grid like shown: What is the area of the space he can cover with the carpet?

