Expand and re-write using only one exponent:

$7^4 \cdot 7^2 =$

$3^3 \cdot 3^5 =$

Examine the exponents. **Describe** a shortcut to simplifying the expressions above?

Property 1: $a^r \cdot a^s =$

Practice: $5^3 \cdot 5^6 =$ $x^7 \cdot x^8 =$ $x^4 y \cdot x^{-3} y^5 =$

Expand and re-write using only one exponent:

$(5^3)^2 =$

$(3^4)^2 =$

Examine the exponents. **Describe** a shortcut to simplifying the expressions above?

Property 2: $(a^r)^s =$

Practice: $(4^5)^6 =$ $(x^{-3})^{-5} =$

Expand and re-write using exponent:

$(2x)^3 =$

$(3xy)^3 =$

Examine the exponents. **Describe** a shortcut to simplifying the expressions above?

Property 3: $(ab)^r =$

Practice: $(3x)^3 =$ $(4x^4)^3 =$ $(2y)^3 (y^2) =$

Expand and re-write using only one exponent:

$$\frac{2^7}{2^4} =$$
$$\frac{x^5}{x^3} =$$
$$\frac{y^{14}}{y^6} =$$

Examine the exponents and discuss a shortcut to simplifying the expressions above:

Property 4: $\quad \dfrac{a^r}{a^s} =$

Practice: $\dfrac{2^{15}}{2^2} =$ $\qquad \dfrac{x^6}{x^9} =$ $\qquad \dfrac{x^7 y^3}{x^6 y^{10}} =$ $\qquad \dfrac{y^3 y^6}{y^2} =$

Expand and re-write using exponent:

$$\left(\frac{3}{2}\right)^3 =$$
$$\left(\frac{2}{5}\right)^4 =$$

Examine the exponents and discuss a shortcut to simplifying the expressions above:

Property 5: $\quad \left(\dfrac{a}{b}\right)^r =$

Practice: $\qquad \left(\dfrac{x}{2}\right)^3 =$ $\qquad \left(\dfrac{x^2 y}{3}\right)^4 =$ $\qquad \left(\dfrac{5}{y}\right)^2 =$

Write each expression as a decimal and then convert to a fraction:

$2^{-1} =$ $\qquad 2^{-2} =$ $\qquad 2^{-3} =$ $\qquad 2^{-4} =$

Examine the exponents and end result. Discuss a shortcut to simplifying the expressions above:

Definition: $\quad a^{-r} =$

Practice: $\qquad 2^{-3} =$ $\qquad x^{-2} =$ $\qquad y^3 x^{-6}$

$\qquad\qquad 2x^3 x^{-7} =$ $\qquad\qquad 3y^2 x^5 y^{-4} =$

Exponent Properties: The Zero Exponent Rule

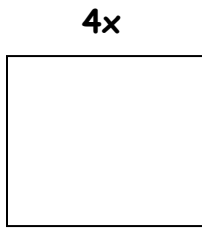| Quotient	Use the quotient rule to write in the form a^b	Look at the original quotient, what is it as just a number?
$\dfrac{2^3}{2^3}$		
$\dfrac{5^7}{5^7}$		
$\dfrac{x^{20}}{x^{20}}$		

What do you think anything to the zero power should equal?
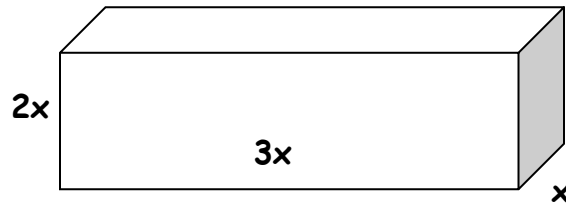
Definition: $a^0 =$

Volume of a Rectangular solid:

4x

Area of a Square

$$A = s^2$$

2x
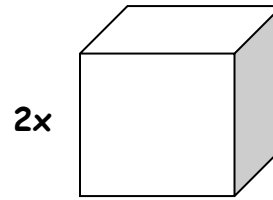
Volume of a Cube

$$V = s^3$$

2x

3x

x

Volume of a rectangular Box

$$V = l \cdot w \cdot h$$