Guiding Question: Can you use your knowledge of exponent rules to simplify exponential expressions?
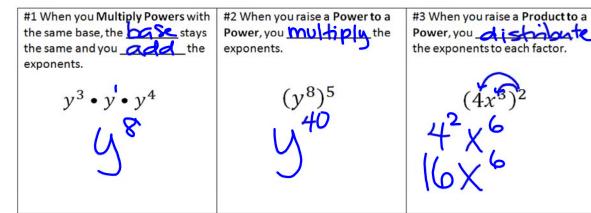
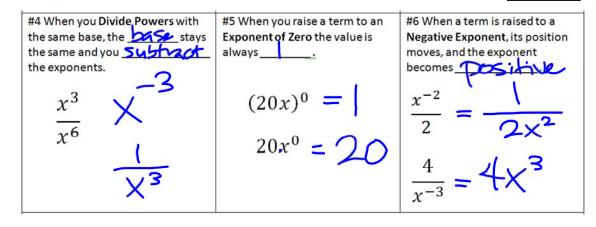| p. 12-13   Exponent Rules Summary   6.4 |
|---|

p. 12

Warm-up: Complete the following problems in the space provided

#1 When you **Multiply Powers** with the same base, the __base__ stays the same and you __add__ the exponents.	#2 When you raise a **Power to a Power**, you __multiply__ the exponents.	#3 When you raise a **Product to a Power**, you __distribute__ the exponents to each factor.
$y^3 \cdot y^1 \cdot y^4$ $$y^8$$	$(y^8)^5$ $$y^{40}$$	$(4x^3)^2$ $$4^2 x^6$$ $$16x^6$$

p. 12

#4 When you **Divide Powers** with the same base, the __base__ stays the same and you __subtract__ the exponents.	#5 When you raise a term to an **Exponent of Zero** the value is always __1__.	#6 When a term is raised to a **Negative Exponent,** its position moves, and the exponent becomes __positive__
$\dfrac{x^3}{x^6}$ x^{-3} $$\dfrac{1}{x^3}$$	$(20x)^0 = 1$ $$20x^0 = 20$$	$\dfrac{x^{-2}}{2} = \dfrac{1}{2x^2}$ $$\dfrac{4}{x^{-3}} = 4x^3$$

Homework:

What questions do you have?

(18) $-2\sqrt[3]{-4a^2} \cdot -5\sqrt[3]{40a^2}$

$10\sqrt[3]{-4a^2 \cdot 40a^2}$

$10(-1)(2)(a)\sqrt[3]{2 \cdot 2 \cdot 5 \cdot a}$

$-20a\sqrt[3]{20a}$

MUST KNOWS – EXPONENT RULES

Multiplying Powers	Power to a Power	Product to a Power	Negative Exponents
$(a^m)(a^n) = a^{m+n}$	$(a^m)^n = a^{m \cdot n}$	$(a^m b^n)^p = a^{m \cdot p} \cdot b^{n \cdot p}$	$a^{-m} = \dfrac{1}{a^m}$
Dividing Powers	**Quotient to a Power**	**Zero Exponent**	**Negative Exponents**
$\dfrac{a^m}{a^n} = a^{m-n}$	$\left(\dfrac{a^m}{b^n}\right)^p = \dfrac{a^{m \cdot p}}{b^{n \cdot p}}$	$a^0 = 1$	$\dfrac{1}{a^{-m}} = a^m$

Simplify the Exponential Expression

1) $2x^3 y^1 \cdot 7x y^{-3}$

$14 x^4 y^{-2}$

$$\boxed{\dfrac{14 x^4}{y^2}}$$

Simplify the Exponential Expression

2) $(2x^0 y z^{-3})^3$

$2^3 x^0 y^3 z^{-9}$

$$\dfrac{8 y^3}{z^9}$$

p. 13

Simplify the Exponential Expression

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

$4^{-2}x^6y^{-8}$

$$\frac{x^6}{4^2y^8} = \frac{x^6}{16y^8}$$

p. 13

Simplify the Exponential Expression

$0 - (-2) = 2$

4) $\dfrac{3 \cdot 5 \cdot 5x^0}{3x^{-2}}$

$5x^2$

p. 13

Simplify the Exponential Expression

5)

$$\left(\frac{3x^5}{2y^3}\right)^2$$

$$\frac{3^2 x^{10}}{2^2 y^6} = \frac{9x^{10}}{4y^6}$$

p. 13

Simplify the Exponential Expression

6)

$$\left(\frac{x^4 y^{-2} z^{-1}}{5xz^0}\right)^2$$

$$\left(\frac{x^3}{5y^2 z^1}\right)^2$$

$$\frac{x^6}{5^2 y^4 z^2} = \frac{x^6}{25 y^4 z^2}$$

Practice:

Worksheet -- do ODDS to start