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WARMUP 10 / $\left(\frac{30}{4} \cdot \frac{20}{6}\right)$

Simplify each:

1. $\frac{7x^5}{7x^3}$

2. $\frac{7^5}{7^3}$

3. -4^{-3}

WHEN YOU HAVE COEFFICIENTS, MULTIPLY OR DIVIDE THEM JUST LIKE NORMAL NUMBERS!

HELPFUL HINT

- If you are ever not sure about what to do, just **expand** it out!!!

SUPER-CRAZY EXAMPLE

Simplify:

$$\frac{-2a^6 \cdot 6b^3 \cdot a \cdot 4b^5}{18b^4 \cdot a^5 \cdot 3b^2}$$

CHECK HOMEWORK

RETURN OF THE QUIZZES

WHAT ABOUT FRACTIONS?

1. $\left(\frac{1}{4}\right)^2$
2. $\left(\frac{2}{3}\right)^3$
3. $\left(\frac{4}{25}\right)^0$
4. $\left(\frac{1}{100}\right)^{-1}$
5. $\left(\frac{2}{5}\right)^{-2}$

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Power to a Power

Objective:

Taking something that is already a power and raising it to another power

- Expressions like $(x^5)^3$

TAKING A POWER TO A POWER

$$(x^3)^4 \quad (a^5)^2 \quad (p^1)^6$$

$$(m^5n^2)^3 \quad \left(\frac{b}{c^3}\right)^4$$

$$(3y^4)^2 \quad \left(\frac{k^7}{4}\right)^3$$

Pick a few of these and see if you can figure out how to **simplify** them. Can you come up with a rule?

Taking a Power to a Power

- **Keep the base, multiply the exponents**

EXAMPLES

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

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

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

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

EXAMPLES

$$5. (3x^4 \cdot x^2)^5 \quad (3x^6)^5 = 243x^{30}$$

$$6. \left(\frac{m^3}{m^8}\right)^4 \quad (m^{-5})^4 = m^{-20} = \frac{1}{m^{20}}$$

$$7. \left(\frac{4g^{50}}{12g^{30}}\right)^2 \quad \left(\frac{g^{20}}{3}\right)^2 = \frac{g^{40}}{9}$$

IMPORTANT

- An expression that contains negative or zero exponents is not considered to be simplified. Expressions should be rewritten with only positive exponents.

HOMEWORK

Worksheet