

Bell Ringer - Simplify the expression using positive exponents

$$1. \ 4k^{-3} \cdot m^{-2}$$

$$\frac{4}{k^3 m^2}$$

$$2. \ (4n^{-2})^{-3}$$

$$\frac{4^{-3} n^6}{n^6}$$
$$\frac{n^6}{4^3}$$
$$\frac{n^6}{64}$$

Division Properties of Exponents

Quotient of Powers: to divide powers having like bases, subtract the exponents.

$$\text{Ex. } \frac{a^9}{a^3} = a^6$$

$$\frac{8^7}{8^3} = 8^4$$

$$\frac{\cancel{8} \cdot \cancel{8} \cdot \cancel{8} \cdot \cancel{8} \cdot \cancel{8} \cdot \cancel{8} \cdot \cancel{8}}{\cancel{8} \cdot \cancel{8} \cdot \cancel{8}}$$

Note: do not divide the base.

Power of a Quotient: to find a power of a quotient, find the power of the numerator and the power of the denominator, then divide.

$$\text{Ex. } \left(\frac{a}{b} \right)^3 = \frac{a^3}{b^3}$$

Key Point - make sure to identify the base each time.

Simplify the expression using positive exponents.

$$1. \frac{a^{12}}{a^{-4}}$$

$$a^{12 - -4}$$

$$a^{16}$$

Simplify the expression using positive exponents.

$$2. \frac{8^5}{8^9}$$

$$\frac{8^{5-9}}{8^{-4}} = \frac{1}{8^4}$$

Simplify the expression using positive exponents.

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

$$\frac{3^{-4}}{2^{-4}} = \frac{2^4}{3^4} = \frac{16}{81}$$

Simplify the expression using positive exponents.

$$4. -\left(\frac{4}{x}\right)^2$$

$$-\frac{4^2}{x^2} = \frac{16}{x^2}$$

Simplify the expression using positive exponents.

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

$$\frac{3^3 x^6 y^3}{y^6} = \frac{27 x^6 y^{-3}}{1} = \frac{27 x^6}{y^3}$$

Simplify the expression using positive exponents.

$$6. \quad \frac{3x^3y}{4x} \cdot \frac{12x^2y^2}{y^3}$$

Problem has multiple ways to solve.

$$\frac{36x^5y^3}{4xy^3} = \frac{9x^4}{1}$$

$$\frac{36}{4} = 9 \quad x^{5-1} = x^4 \quad y^{3-3} = 0 \text{ } y's \text{ left}$$