

Target 7-2 Division Property of Exponents

Algebra 1
4-2-14

I can... multiply and divide monomials using the properties of exponents and simplify expressions.

Expand and divide:

$$\frac{a^4}{a^2} = \frac{\cancel{a} \cdot \cancel{a} \cdot a \cdot a}{\cancel{a} \cdot \cancel{a}} = \frac{a^2}{1} = \boxed{a^2}$$

$$\frac{b^4}{b^7} = \frac{\cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b}}{\cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot b \cdot b \cdot b} = \frac{1}{b^3}$$

Division Rule of exponents (Quotient)

$$\frac{a^m}{a^n} = a^{m-n}$$

* subtract smallest exponent from biggest exponent. Stay where biggest exponent is.

Rules for division with exponents:

1. Bases must be the same.
2. Divide the coefficients.
3. Subtract smallest exponent from the biggest exponent.
4. Stay where biggest exponent was.

Dividing Exponents:

$$\textcircled{1} \frac{x^7}{x^5} = x^{7-5} = x^2 \quad \textcircled{2} \frac{b^3}{b^1} = b^{3-1} = b^2$$

$$\textcircled{3} \frac{y^3}{y^{10}} = \frac{1}{y^{10-3}} = \frac{1}{y^7} \quad \textcircled{4} \frac{6x^2}{2x^7} = \frac{3}{x^{7-2}} = \frac{3}{x^5}$$

Practice:

$$\textcircled{1} \frac{a^5}{a^3} = a^{5-3} = a^2$$

$$\textcircled{2} \frac{8c^6}{4d^2} = \frac{2c^6}{d^2}$$

$$\textcircled{3} \frac{2g^3}{4g^7} = \frac{1}{2g^{7-3}} = \frac{1}{2g^4}$$

$$\textcircled{4} \frac{h^9x^3}{x^5h^4} = \frac{h^{9-4}}{x^{5-3}} = \frac{h^5}{x^2}$$

Challenge:

$$\left(\frac{4c^3d^2}{5}\right)^3 = \frac{4c^3d^2}{5} \cdot \frac{4c^3d^2}{5} \cdot \frac{4c^3d^2}{5} = \frac{4^3c^9d^6}{5^3} = \boxed{\frac{64c^9d^6}{125}}$$

$$\left(\frac{3m^3n^2}{4p^5q}\right)^3 = \frac{3m^3n^2}{4p^5q} \cdot \frac{3m^3n^2}{4p^5q} \cdot \frac{3m^3n^2}{4p^5q} = \frac{3^3m^9n^6}{4^3p^{15}q^3} = \boxed{\frac{27m^9n^6}{64p^{15}q^3}}$$

$$\frac{x^7y^{12}}{x^6y^3} = \frac{x^{7-6}y^{12-3}}{1} = \boxed{xy^9}$$

$$\frac{x^2}{x^5} = \frac{1}{x^{5-2}} = \boxed{\frac{1}{x^3}}$$

$$\frac{a^3b^9}{ab^2} = \frac{a^{3-1}b^{9-2}}{1} = \boxed{a^2b^7}$$

$$\frac{36x^5y^8z^3}{9x^4y^2z^6} = \frac{4x^{5-4}y^{8-2}}{z^{6-3}} = \boxed{\frac{4xy^6}{z^3}}$$

Hw: worksheet dividing exponents