

Warm-up

$$\textcircled{1} \quad 3x^5 \cdot 2x^{13}$$

$$3 \cdot 2 x^{18}$$

OR

$$6x^{18}$$

$$\textcircled{2} \quad (5y^{12})^2$$

$$5^2 y^{24}$$

$$\textcircled{3} \quad (2y^6)^2 (4x^3y)^3$$

$$2^2 y^{12} \cdot 4^3 x^9 y^3$$

$$2^2 4^3 x^9 y^{15}$$

8.2 Quotients & Exponents

Quotient of Powers

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

$$\frac{2^5}{2^2} = \frac{\cancel{2}^1 \cancel{2}^1 \cancel{2}^1 \cancel{2}^1 \cancel{2}^1}{\cancel{2}^1 \cancel{2}^1} = 2^3 \text{ or } 2^{5-2}$$

Power of Quotient

$$\left(\frac{a}{b}\right)^m = \frac{a^{1 \cdot m}}{b^{1 \cdot m}} = \frac{a^m}{b^m}$$

$$\left(\frac{2^3}{3^4}\right)^3 = \frac{2^{1 \cdot 3}}{3^{4 \cdot 3}} = \frac{2^3}{3^{12}}$$

Examples

$$\textcircled{1} \left(\frac{-7^1}{x^8}\right)^2$$

$$\frac{(-7)^2}{x^{16}}$$

$$\textcircled{2} \frac{1}{y^5} \cdot \frac{y^8}{1}$$

$$\frac{y^8}{y^5} = y^{8-5} = y^3$$

$$\textcircled{3} \left(\frac{4^1 \cdot 2^2}{5^1 \cdot 4^1}\right)^3$$

$$\frac{4^3 \cdot 2^6}{5^3 \cdot 4^3}$$