

Dividing Powers

$$\text{Ex - } \frac{a^6}{a^4} = \frac{\cancel{a \cdot a \cdot a \cdot a \cdot a \cdot a}}{\cancel{a \cdot a \cdot a \cdot a}} = a^2$$

Quotient of Powers: To divide 2 powers that have the same base, subtract the exponents.

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

More Examples

$$5) \frac{(-4)^7}{(-4)^4} = (-4)^{7-4} = (-4)^3 = -64 \frac{(-4)(-4)(-4)(-4)(-4)(-4)(-4)}{(-4)(-4)(-4)(-4)}$$

Power of a Fraction Property

$$\left(\frac{x}{y}\right)^m = \frac{x^m}{y^m} \quad 6) \left(\frac{1}{3}\right)^4 \cdot 3^{12} = \frac{1^4}{3^4} \cdot \frac{3^{12}}{1} = \frac{3^{12}}{3^4} = 3^8$$

Basic Examples - Simplify and write your answer using exponents.

$$1. \frac{2^6}{2^4} = 2^{6-4} = 2^2$$

$$2. \frac{10^9}{10^2} = 10^{9-2} = 10^7$$

$$3. \frac{x^a}{x^1} = x^{a-1}$$

$$4. \frac{y^{10}}{y^1} = y^{10-1} = y^9$$

Simplify the expression

$$7. \left(\frac{a}{y}\right)^9 = \frac{a^9}{y^9}$$

10. Find the missing exponent.

$$\left(\frac{2c^3}{d^2}\right)^? = \frac{16c^{12}}{d^8}$$

$$? = 4$$

$$8. \left(\frac{x^2}{3y^3}\right)^2 = \frac{x^4}{9y^6}$$

$$9. \left(\frac{3x^3y^4}{x^2}\right)^3 \cdot \left(\frac{y^2x^4}{5y}\right)^2 = \frac{27x^9y^{12}}{x^6} \cdot \frac{y^4x^8}{25y^2} = \frac{27x^{17}y^7}{25x^6y^2} = \frac{27x^{11}y^5}{25}$$