

Key Concepts: Negative exponents Division by Monomials

Example 1

- a. Simplify $\frac{x^2}{x^7}$ by expanding the numerator and denominator and dividing out factors of 1.
- b. Use the rule $\frac{a^m}{a^n} = a^{m-n}$ to simplify $\frac{x^2}{x^7}$.
- c. What's the only logical conclusion?

Example 2

Simplify by expanding the numerator and denominator and dividing out factors of 1.

- a. Simplify $\frac{y}{y^4}$ by expanding the numerator and denominator and dividing out factors of 1.
- b. Use the rule $\frac{a^m}{a^n} = a^{m-n}$ to simplify $\frac{y}{y^4}$.
- c. What's the only logical conclusion?

Complete the pattern in Table 1.

Table 1: Powers of 2

2^5	2^4	2^3	2^2	2^1	2^0	2^{-1}	2^{-2}	2^{-3}	2^{-4}
32	16	8							

Completely simplify each expression. Make sure that your final expression has no negative exponents.

a. t^{-6}

b. $2t^{-6}$

c. $-t^{-6}$

c. $x^{-9}x^5$ (Work this one with rules of exponents and by canceling factors.)

d. -4^2

e. 4^{-2}

f. -4^{-2}

g. $(-4)^{-2}$

Find each value.

$$3^{-2}$$

$$-7^{-1}$$

$$10^{-5}$$

$$\frac{1}{2^{-8}}$$

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

$$-4^0 - 4^{-2}$$

Completely simplify each expression. Make sure that your final expression contains no negative exponents.

$$3x^2y^{-1}$$

$$3y^{-1}$$

$$\frac{4x^2y^7}{12x^{10}y}$$

$$(3y)^{-1}$$

$$\frac{3^{-2}x^{-4}y^{12}}{x^{-8}y^{16}}$$

$$\frac{-4a^{-8}}{b^{-9}}$$

$$(x+y)^{-2}$$

$$\left(3a^{-2}b^4\right)^{-2}$$

$$\frac{\left(4x^{-1}y^5\right)^{-3}\left(x^2y^{-8}\right)^0}{\left(2xy^2\right)^{-6}}$$

$$\left(\frac{5x^{-8}z}{4^{-1}x^{14}z^{-3}}\right)^{-2}$$

Perform the division $\frac{22x^7 - 11x^4 + 55x^2}{11x^2}$.

Divide $25y^{10} + 35y^7 - 50y^6$ by $5y^5$.

Perform the division $\frac{84x^9 + 34x^8 + 40x^7 + 4x^6}{4x^6}$