Algebra 1   7.2

$$\frac{2^7}{2^4}$$

Use the properties of exponents to divide monomials

Simplify expressions containing negative exponents

$$\frac{t^4}{t^3}$$

Simplify expressions containing zero exponents

Compare measurements using order of magnitude

Zero exponent = 1

reciprocal

exponent

base

quotient

factors

— negative exponent

order of magnitude

$$x^{-3} \qquad \frac{1}{x^3}$$

power OK, location wrong

Triangle puzzle (?)

$$\frac{1}{a^{-s}} = a^s$$

ICE WS

KeyConcept Zero Exponent Property

Words   Any nonzero number raised to the zero power is equal to 1.   *why?*

Symbols   For any nonzero number a, $a^0 = 1$.

Examples $15^0 = 1$ $\left(\dfrac{b}{c}\right)^0 = 1$ $\left(\dfrac{2}{7}\right)^0 = 1$

⬢ **Key**Concept **Negative Exponent Property**

Words   For any nonzero number a and any integer n, a^{-n} is the reciprocal of a^n. Also, the reciprocal of a^{-n} is a^n.

Symbols   For any nonzero number a and any integer n, $a^{-n} = \dfrac{1}{a^n}$.

Examples $2^{-4} = \left(\dfrac{1}{2^4}\right) = \dfrac{1}{16}$ $\left(\dfrac{1}{j^{-4}}\right) = \dfrac{j^4}{1}$

negative exponent = code for reciprocal

Example 4 Negative Exponents

Simplify each expression. Assume that no denominator equals zero.

a. $\dfrac{\cancel{3p^4}\, 2p^4\, r^2}{\cancel{5}\, 4n^5}$

$$\frac{1}{2}\, \frac{p^4 r^2}{n^5}$$

b. $\dfrac{5r^{-3}t^4}{-20r^2t^7u^{-5}}$

$$\dfrac{\cancel{t}\ \cancel{t}\ \cancel{t}\ \cancel{t}\ \cancel{t}\ uuuuu}{rrrrr\ \cancel{t}\ \cancel{t}\ \cancel{t}\ \cancel{t}\ ttt}$$

final answer: exponents positive
no zero exponents

$$\dfrac{1}{-4}\dfrac{u^5}{r^5t^3}$$

GuidedPractice

Simplify each expression. Assume that no denominator equals zero.

4A. $\dfrac{wx^2 y^6}{wy^5 v^3}$

4B. $\dfrac{32a^{-8}b^3c^{-4} n^0}{4a^3b^5c^{-2}}$

4C. $\dfrac{5j^{-3}k^2m^{-6}}{25k^{-4}m^{-2}}$

$\dfrac{w\,yyyyyy\,xx}{w\,vvv}$

$\dfrac{y^6 x^2}{v^3}$

$\dfrac{8\ bbbb\ aa\ \cdot\ 1}{aaal\ aaaaaaaa\ ccc\ bbbbb}$

$\dfrac{8}{a^{11}c^2b^2}$