

Additional practice problems involving exponents

1. Use the rule $\frac{a^m}{a^n} = a^{m-n}$ to simplify each expression.

a. $\frac{x^7}{x^{-3}}$ b. $\frac{y^{-2}}{y^{-5}}$ c. $\frac{6^2}{6^{-1}}$ d. $\frac{(-2)^{-3}}{(-2)^{-5}}$ e. $\frac{2}{2^{-2}}$

2. Simplify each expression after first changing all of the negative exponents to positive exponents.

a. $\frac{x^7}{x^{-3}}$ b. $\frac{y^{-2}}{y^{-5}}$ c. $\frac{6^2}{6^{-1}}$ d. $\frac{(-2)^{-3}}{(-2)^{-5}}$ e. $\frac{2}{2^{-2}}$

3. Use the rule $\frac{a^m}{a^n} = \frac{1}{a^{n-m}}$ to simplify each expression.

a. $\frac{x^{-7}}{x^{13}}$ b. $\frac{y^{-2}}{y^5}$ c. $\frac{6^{-2}}{6^{-1}}$ d. $\frac{(-2)^{-7}}{(-2)^{-5}}$ e. $\frac{2^{-5}}{2}$

4. Simplify each expression after first changing all of the negative exponents to positive exponents.

a. $\frac{x^{-7}}{x^{13}}$ b. $\frac{y^{-2}}{y^5}$ c. $\frac{6^{-2}}{6^{-1}}$ d. $\frac{(-2)^{-7}}{(-2)^{-5}}$ e. $\frac{2^{-5}}{2}$

5. Rewrite each expression without negative or zero exponents and completely simplify each numeric factor. Also, your final result should contain no grouping symbols. **No Calculator!**

a. xy^{-2} b. $8y^{-2}$ c. ab^{-1} d. $-6b^{-1}$ e. pq^0 f. $12q^0$

g. $\frac{t}{x^{-3}}$ h. $\frac{93}{x^{-3}}$ i. $\frac{1}{xy^{-8}}$ j. $\frac{1}{7y^{-8}}$ k. $\frac{1}{ab^{-28}}$ l. $\frac{1}{2b^{-28}}$

m. $\frac{x^{-2}}{y^{-3}}$ n. $\frac{x^2}{y^{-3}}$ o. $\frac{x^{-2}}{y^3}$ p. $\frac{6^{-2}}{y^{-3}}$ q. $\frac{6^2}{y^{-3}}$ r. $\frac{6^{-2}}{y^3}$

Problem 5 continues on page 2.

s. $\frac{x^{-2}}{2^{-3}}$ t. $\frac{x^2}{2^{-3}}$ u. $\frac{x^{-2}}{2^3}$ v. $\frac{6^{-2}}{2^{-3}}$ w. $\frac{6^2}{2^{-3}}$ x. $\frac{6^{-2}}{2^3}$

y. $(xy)^{-2}$ z. $(8x)^{-2}$ A. $(ab)^{-7}$ B. $(-2b)^{-7}$ C. $(pq)^0$ D. $(2q)^0$

E. $\left(\frac{t}{x^{-3}}\right)^{-1}$ F. $\left(\frac{93}{x^{-3}}\right)^{-1}$ G. $\frac{1}{(xy^{-8})^{-2}}$ H. $\frac{1}{(7y^{-8})^{-2}}$ I. $\left(\frac{1}{ab^{-28}}\right)^{-2}$ J. $\left(\frac{1}{2b^{-28}}\right)^{-2}$

K. $\frac{1}{6^{-2}}$ L. $-\frac{2^{-1}}{3}$ M. -3^0 N. $(-7)^{-2}$ O. -8^{-2} P. $-6^{-2} - 6^{-2}$

Q. $\frac{(3^{-1}x^{-2})^2}{(3xy^{-3})^{-2}}$ R. $\left(-\frac{2x^2y^4}{4^{-1}y^{-3}}\right)^{-2}$ S. $\left(\frac{x^{-2}}{y^3}\right)^{-1}$ T. $\frac{(-6^{-2})^{-1}}{(-y^{-3})^{-2}}$