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8-2 Study Guide and Intervention

Dividing Monomials

Quotients of Monomials To divide two powers with the same base, subtract the exponents.

Quotient of Powers	For all integers m and n and any nonzero number a, $\frac{a^m}{a^n} = a^{m-n}$.
Power of a Quotient	For any integer m and any real numbers a and b, $b \neq 0$, $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$.

Example 1 **Simplify $\frac{a^4b^7}{ab^2}$. Assume neither a nor b is equal to zero.**

$\frac{a^4b^7}{ab^2} = \left(\frac{a^4}{a}\right)\left(\frac{b^7}{b^2}\right)$ Group powers with the same base.

$= (a^{4-1})(b^{7-2})$ Quotient of Powers

$= a^3b^5$ Simplify.

The quotient is a^3b^5 .

Example 2 **Simplify $\left(\frac{2a^3b^5}{3b^2}\right)^3$. Assume that b is not equal to zero.**

$\left(\frac{2a^3b^5}{3b^2}\right)^3 = \frac{(2a^3b^5)^3}{(3b^2)^3}$ Power of a Quotient

$= \frac{2^3(a^3)^3(b^5)^3}{(3)^3(b^2)^3}$ Power of a Product

$= \frac{8a^9b^{15}}{27b^6}$ Power of a Power

$= \frac{8a^9b^9}{27}$ Quotient of Powers

The quotient is $\frac{8a^9b^9}{27}$.

Lesson 8-2

Exercises

Simplify. Assume that no denominator is equal to zero.

1. $\frac{5^5}{5^2}$ 5^3 or 125
2. $\frac{m^6}{m^4}$ m^2
3. $\frac{p^5n^4}{p^2n}$ p^3n^3
4. $\frac{a^2}{a}$ a
5. $\frac{x^5y^3}{x^5y^2}$ y
6. $\frac{-2y^7}{14y^5}$ $-\frac{1}{7}y^2$
7. $\frac{xy^6}{y^4x}$ y^2
8. $\left(\frac{2a^2b}{a}\right)^3$ $8a^3b^3$
9. $\left(\frac{4p^4q^4}{3p^2q^2}\right)^3$ $\frac{64}{27}p^6q^6$
10. $\left(\frac{2v^5w^3}{v^4w^3}\right)^4$ $16v^4$
11. $\left(\frac{3r^6s^3}{2r^5s}\right)^4$ $\frac{81}{16}r^4s^8$
12. $\frac{r^7s^7t^2}{s^3r^3t^2}$ r^4s^4

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8-2 Skills Practice

Dividing Monomials

Simplify. Assume that no denominator is equal to zero.

1. $\frac{6^5}{6^4}$ 6^1 or 6

2. $\frac{9^{12}}{9^8}$ 9^4 or 6561

3. $\frac{x^4}{x^2}$ x^2

4. $\frac{r^3s^2}{r^3s^4}$ $\frac{1}{s^2}$

5. $\frac{m}{m^3}$ $\frac{1}{m^2}$

6. $\frac{9d^7}{3d^6}$ $3d$

7. $\frac{12n^5}{36n}$ $\frac{n^4}{3}$

8. $\frac{w^4u^3}{w^4u}$ u^2

9. $\frac{a^3b^5}{ab^2}$ a^2b^3

10. $\frac{m^7n^2}{m^3n^2}$ m^4

11. $\frac{-21w^5u^2}{7w^4u^5}$ $-\frac{3w}{u^3}$

12. $\frac{32x^3y^2z^5}{-8xyz^2}$ $-4x^2yz^3$