

Practice : Section 1-3 WS**/26** Form G

Division Properties of Exponents

Simplify each expression.

1. $\frac{5^6}{5^2}$

2. $\frac{5^5}{5^2}$

3. $\frac{x^{\frac{5}{8}}}{x^{\frac{3}{8}}}$

4. $\frac{m^{-3}}{m^{-5}}$

5. $\frac{x^6 y^9}{x^2 y^5}$

6. $\frac{21m^{\frac{3}{4}}}{3m^{\frac{1}{4}}}$

7. $\left(\frac{3}{5}\right)^4$

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

9. $\left(\frac{4}{7}\right)^{-2}$

10. $\left(-\frac{3x^4}{2y^5}\right)^{-3}$

11. $\left(\frac{12p^{\frac{3}{2}}}{15p}\right)^{-4}$

12. $\left(\frac{ab^3}{a^5b}\right)^{-2}$

13. $\left(\frac{3x^2y^5z^{-2}}{5xz^5}\right)^{-3}$

14. $\frac{(4m^2)(3n^5)}{(2m^{-3})(-mn)^3}$

Explain why each expression is *not* in simplest form.

15. $2^4 r^3$

16. $(3x)^2$

17. $m^3 n^0$

18. $\frac{y^5}{y}$

Simplify each quotient. Write each answer in scientific notation.

19. $\frac{3.6 \times 10^7}{1.5 \times 10^3}$

20. $\frac{4.5 \times 10^{-6}}{5 \times 10^{-2}}$

Practice (continued)

Form G

Division Properties of Exponents

- 21. Writing** Explain how you divide expressions with numerators and denominators written in scientific notation. How do you handle the exponents? What do you do with the coefficients? Connect your response to the rules you have learned regarding the division properties of exponents.
- 22.** A computer can do a computation in 6.8×10^{-9} seconds. How many computations can the computer do in 5 minutes?
- 23. Error Analysis** A student simplifies the expression $\left(\frac{6^4}{3^2}\right)^3$ as follows:
 $\left(\frac{6^4}{3^2}\right)^3 = [(6 \div 3)^{4-2}]^3 = (2^2)^3 = 64$. What mistake did the student make in simplifying the expression? What is the correct simplification?
- 24. Reasoning** The division property of exponents says that to simplify powers with the same base you subtract the exponents. Use examples to show why powers need to have the same base in order for this technique to work.
- 25.** The area of a triangle is $80x^5y^3$. The height of the triangle is x^4y . What is the length of the base of the triangle?
- 26. Open-Ended** First simplify the expression $\left(\frac{12m^5}{15m}\right)^3$ by raising each factor in the parentheses to the third power and next reducing the result. Then simplify by some other method. Explain your method. Are the results the same? Which method do you prefer?