

## 10.3

## 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.  $a^4 - 3$

16.  $(a - 2)$

notation.

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

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

22. A computer can do a computation in  $6.8 \times 10^{-9}$  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
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

y  
h