

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Module 11** Simplifying Algebraic Expressions  
with Polynomials  
**Lesson 1** Applying Rules of Exponents



**independent  
practice**

Simplify.

- |   |   |
|---|---|
| 1. $2^4 \cdot 2^6$ _____                    | 2. $3^{-3} \cdot 3^6$ _____                               |
| 3. $3^2 \cdot 2^3$ _____                    | 4. $(x^2y^3)(x^4y^6)$ _____                               |
| 5. $x^2y^0z^{-4}$ _____                     | 6. $r^{-3}s^5$ _____                                      |
| 7. $(ab)^4$ _____                           | 8. $(2c^2d)^3$ _____                                      |
| 9. $(-2a^4b^3)^2(a^5b)$ _____               | 10. $(-\frac{3}{4}c)^2$ _____                             |
| 11. $(0.4x^2y^4)^2$ _____                   | 12. $(\frac{3}{4}x^2y^{-2})(\frac{2}{3}x^5y^8)^3$ _____   |
| 13. $8a(b^4c^5)^3$ _____                    | 14. $(5^2c^2d^3)^{-2}$ _____                              |
| 15. $\frac{2^5}{2^3}$ _____                 | 16. $\frac{3^6}{3^8}$ _____                               |
| 17. $(\frac{x}{2})^{-3}$ _____              | 18. $\frac{x^{-3}}{x^5}$ _____                            |
| 19. $\frac{2x^3y}{4x^2y^3}$ _____           | 20. $\frac{15x^2y^3z^5}{18xy^{-2}z^{-4}}$ _____           |
| 21. $(\frac{8^{-2}x^3y^4}{z^{10}})^0$ _____ | 22. $\frac{3^4x^2y^{-4}}{3^2x^3y^{-5}}$ _____             |
| 23. $\frac{(a^4b^5c)^2}{(ab^2)^{-2}}$ _____ | 24. $\frac{(3m^{-3}n^2p^4)^{-2}}{2m^4n^{-3}p^{-1}}$ _____ |

## Journal

- Meko says that  $2^3 \cdot 3^4$  is  $6^7$ . Show Meko his mistake and help him find the correct way to simplify this expression.
- Nora does not believe it makes sense that  $a^0$  is one. Use the following pattern to convince her:  $10^4 = 10,000$ ,  $10^3 = 1,000$ ,  $10^2 = 100$ , . . .
- Give an example to show that  $(x^a)^b = x^{ab}$ .
- Explain the method used for multiplying expressions involving exponents in your own words.
- Explain the method used for dividing expressions involving exponents in your own words.

## Cumulative Review

Solve each equation or system of equations.

1.  $3x - 4 = 5$  \_\_\_\_\_

2.  $4a - 6 = 12$  \_\_\_\_\_

3.  $2(d - 2) = 18$  \_\_\_\_\_

4.  $4z + 18 - 5z = 2z + 21$  \_\_\_\_\_

5. 
$$\begin{aligned} x &= 2 \\ 2x + y &= 7 \end{aligned}$$
 \_\_\_\_\_

6. 
$$\begin{aligned} y &= 4x \\ x - y &= 6 \end{aligned}$$
 \_\_\_\_\_

7. 
$$\begin{aligned} 3x + y &= 6 \\ 5x - y &= -2 \end{aligned}$$
 \_\_\_\_\_

8. 
$$\begin{aligned} x - 2y &= 15 \\ 3x + 2y &= 13 \end{aligned}$$
 \_\_\_\_\_

9. Joe makes \$8.25 per hour mowing lawns. This week he made \$198. How many hours did he work? \_\_\_\_\_