

# Concept Byte

Use With Lesson 7-2

ACTIVITY

# Multiplying Powers

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**Prepares for N-RN.A.1** Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values . . .

MP 7

You can use patterns to find a shortcut for multiplying powers.

## Activity 1

Copy and complete each statement in Exercises 1–8.

1.  $2^2 \cdot 2^2 = 2 \cdot 2 \cdot 2 \cdot 2 = 2^4 = 2^{2+}$   $\square$

2.  $3^2 \cdot 3^2 = 3 \cdot 3 \cdot 3 \cdot 3 = 3^4 = 3^{2+}$   $\square$

3.  $3^3 \cdot 3^2 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 = 3^{\square} = 3^{\square+}$   $\square$

4.  $4^3 \cdot 4^2 = 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 = 4^{\square} = 4^{\square+}$   $\square$

5.  $5^1 \cdot 5^2 = 5 \cdot 5 \cdot 5 = 5^{\square} = 5^{\square+}$   $\square$

6.  $6^3 \cdot 6^3 = \square = 6^{\square} = 6^{\square+}$   $\square$

7.  $7^2 \cdot 7^6 = \square = 7^{\square} = 7^{\square+}$   $\square$

8.  $10^3 \cdot 10^7 = \square = 10^{\square} = 10^{\square+}$   $\square$

- © 9. a. **Look for a Pattern** What pattern do you see in your answers to Exercises 1–8?  
b. **Predict** Use your pattern to predict the solution to  $7^5 \cdot 7^6 = 7^{\square}$ .  
c. **Generalize** Use your pattern to predict the value of  $x^n \cdot x^m$ .

You can find a similar pattern when multiplying powers with negative exponents.

## Activity 2

Copy and complete each statement in Exercises 10–15.

10.  $2^2 \cdot 2^{-1} = 2 \cdot 2 \cdot \frac{1}{2} = 2^1 = 2^{2+}$   $\square$

11.  $2^4 \cdot 2^{-2} = 2 \cdot 2 \cdot 2 \cdot 2 \cdot \frac{1}{2} \cdot \frac{1}{2} = 2^{\square} = 2^{4+}$   $\square$

12.  $3^3 \cdot 3^{-2} = 3 \cdot 3 \cdot 3 \cdot \frac{1}{3} \cdot \frac{1}{3} = 3^{\square} = 3^{3+}$   $\square$

13.  $4^{-3} \cdot 4^3 = \frac{1}{4} \cdot \frac{1}{4} \cdot \frac{1}{4} \cdot 4 \cdot 4 \cdot 4 = 4^{\square} = 4^{\square+}$   $\square$

14.  $8^{-4} \cdot 8^6 = \square = 8^{\square} = 8^{\square+}$   $\square$

15.  $12^{-3} \cdot 12^7 = \square = 12^{\square} = 12^{\square+}$   $\square$

- © 16. a. **Look for a Pattern** What pattern do you see in your answers to Exercises 10–15?  
b. **Predict** Use your pattern to predict the solution to  $9^5 \cdot 9^{-7} = 9^{\square}$ .  
c. **Generalize** Use your pattern to predict the value of  $x^n \cdot x^{-m}$ .