

Challenge Problems

5.6

NAME _____

Module 5 Decimal Operations, Exponents, and Powers
Lesson 6 Powers and Exponents

Set 1

- 1 Express each product using exponents.

$$2^3 \times 2^4$$

$$3^2 \times 3^3$$

$$8^4 \times 8^{-4}$$

- 2 Use the results of Problem 1 to make a conjecture about multiplying powers with the same base.

Possible Answers

Set 1

1. $2^3 \times 2^4$
 $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$
 $2^3 \times 2^4 = 2^7$

$$3^2 \times 3^3$$
$$3 \times 3 \times 3 \times 3 \times 3$$
$$3^2 \times 3^3 = 3^5$$

$$8^4 \times 8^{-4}$$
$$8^4 \times \frac{1}{8^4} = \frac{8^4}{8^4} = 1$$
$$8^4 \times 8^{-4} = 8^0$$

2. **Conjecture:** When multiplying two powers with the same base, keep the base with the exponent of the final answer being the sum of the two exponents.

$$x^m \cdot x^n = x^{m+n}.$$

