EXAMPLE 1 Writing Expressions as Powers

Write each product as a power.

a. $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7$

Because 7 is used as a factor 5 times, its exponent is 5.

So, $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 7^5$.

b. $12 \times 12 \times 12$

Because 12 is used as a factor 3 times, its exponent is 3.

So, $12 \times 12 \times 12 = 12^3$.

c. $100 \times 100 \times 100 \times 100 \times 100 \times 100$

Because 100 is used as a factor 6 times, its exponent is 6.

So, $100 \times 100 \times 100 \times 100 \times 100 \times 100 = 100^6$.

Try It **Write the product as a power.**

1. $2 \times 2 \times 2$
2. $6 \cdot 6 \cdot 6 \cdot 6 \cdot 6 \cdot 6$
3. $15 \times 15 \times 15 \times 15$
4. $20 \cdot 20 \cdot 20 \cdot 20 \cdot 20 \cdot 20 \cdot 20$

EXAMPLE 2 Finding Values of Powers

Find the value of each power.

a. 7^2

$7^2 = 7 \cdot 7$ Write as repeated multiplication.

$= 49$ Simplify.

b. 5^3

$5^3 = 5 \cdot 5 \cdot 5$

$= 125$

Try It **Find the value of the power.**

5. 6^3
6. 9^2
7. 3^4
8. 18^2

The square of a whole number is a **perfect square**.

EXAMPLE 3 Identifying Perfect Squares

Determine whether each number is a perfect square.

a. 64

▶ Because $8^2 = 64$, 64 is a perfect square.

b. 20

▶ No whole number squared equals 20. So, 20 is not a perfect square.

Try It **Determine whether the number is a perfect square.**

9. 25 **10.** 2 **11.** 99 **12.** 36

Self-Assessment for Concepts & Skills

Solve each exercise. Then rate your understanding of the success criteria in your journal.

FINDING VALUES OF POWERS **Find the value of the power.**

13. 8^2 **14.** 3^5 **15.** 11^3

16. VOCABULARY How are exponents and powers different?

17. VOCABULARY Is 10 a perfect square? Is 100 a perfect square? Explain

18. WHICH ONE DOESN'T BELONG? Which one does *not* belong with the other three? Explain your reasoning.

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

$3 + 3 + 3 + 3 = 3 \times 4$ $5 \cdot 5 \cdot 5 = 5^3$