Lesson 6-3 · Session 1

Writing Repeated Factors as Powers

Name _____ Date _____ Period _____

Maryland Standard 6.AT.5 · Learning target — I can write repeated multiplication as a power and name its base and exponent.

Show a model, calculation, or explanation. Answer every part and label units when needed.

Exercises 1–12 earn 1 point for a correct response and 1 for supporting work. Spiral Review and Test Practice earn 1 point each.

Learn from a model

REMEMBER

- A power has a base and an exponent: the exponent tells how many times the base is used as a factor.
- Example: 5 × 5 × 5 = 5-cubed (read '5 to the third power').
- Watch out — 5 to the 3rd power is 125, not 15.
- Check it — count the factors in the expanded form against your exponent.

WORKED EXAMPLE

Writing Repeated Multiplication as a Power Write 9 × 9 × 9 × 9 as a power. Then name its base and its exponent.

Step 1 Find the repeated factor. The factor is 9.

Step 2 Count how many times it is used. It is used 4 times.

Step 3 Write the base, then the exponent. 9^4

Step 4 Read it out loud. 9 to the 4th power

Answer **$9 \times 9 \times 9 \times 9 = 9^4$. The base is 9 and the exponent is 4.**

Practice

1. Write 3 × 3 × 3 × 3 as a power. _____

Answer _____

SHOW YOUR THINKING

2. Write 7 × 7 as a power. _____

Answer _____

SHOW YOUR THINKING

3. Write 2 × 2 × 2 × 2 × 2 as a power, and identify the base and the exponent.

Answer _____

RECORD YOUR RESPONSE

4. Complete each line about powers.

a. Write 6 × 6 × 6 × 6 × 6 as a power. _____
b. Write 10 × 10 × 10 as a power. _____
c. The base of 14^3 is _____
d. The exponent of 9^7 is _____
e. Write 4^2 in expanded form. _____
Answer _____

SHOW YOUR THINKING

5. Domino Line. A domino pattern uses 15 as a factor four times. Write the pattern as a power, then name its base and exponent.

Answer _____

SHOW YOUR THINKING

6. Square Mural. A square mural has 25 tiles along every side, filling the whole square. Write the number of tiles as a power.

Answer _____

SHOW YOUR THINKING

7. Fraction Base. Write 2/3 to the 3rd power as a product of factors. Then explain what the exponent tells you to do.

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

8. Andre wrote $5 \times 5 \times 5 \times 5 \times 5 \times 5$ as 6^5, saying there are six 5s. Explain his mistake, then write the correct power.

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

9. Write $4 \times 4 \times 4$ as a power and name its base and exponent.

Answer _____ power, base, exponent

SHOW YOUR THINKING

10. Write $10 \times 10 \times 10 \times 10 \times 10$ as a power.

Answer _____ power

SHOW YOUR THINKING

11. Expand It. Write 3 to the 6th power as repeated multiplication.

Answer _____ the product

SHOW YOUR THINKING

12. Find the Mistake. Leo says 2 to the 5th power means 2×5. Explain the mistake.

Answer _____ the mistake and the meaning

EXPLAIN WITH MATHEMATICAL EVIDENCE

Spiral review

13. From Lesson 6-2 Session 1. Find 7/8 ÷ 1/8.

Answer _____

SHOW YOUR THINKING

14. From Lesson 5-7 Session 1. A cube has edges of 7 cm. Find its surface area.

Answer _____

SHOW YOUR THINKING

15. From Lesson 4-1 Session 1. Write 4 out of 25 as a percent.

Answer _____

SHOW YOUR THINKING

Test practice

16. 7 × 7 × 7 × 7 written as a power is —

- □ A. 4 to the 7th
- □ B. 7 to the 4th
- □ C. 28
- □ D. 7 × 4

17. In 9 to the 2nd power, the exponent is —

□ A. 18	□ B. 9
□ C. 2	□ D. 81

18. The repeated factor in a power is called the —

□ A. sum	□ B. exponent
□ C. product	□ D. base

Check and revise

CHECK YOUR MATHEMATICS	HOW DID IT GO?
An exponent counts repeated factors; it is not a multiplier. Every part answered / Work shown / Units labeled when needed	I can do this: Independently / With a hint / With help Question to revisit: _____

One correction or question I want to discuss: _____

Check one result with a model, an inverse operation, or substitution. Explain why the values agree.
Sentence Frame: "I know this because..."