LESSON MAKER PRO

Exponent Power Moves

Use integer exponent rules to simplify expressions.

GRADE 8 · 8.EE.A.1

CCSS.Math.Content.8.EE.A.1 "Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 3 2 × 3 -5 = 3 -3 = 1/3 3 = 1/27."

NAME _____ DATE _____

EXPONENT RULES

When you multiply powers with the same base, add the exponents. When you divide powers with the same base, subtract the exponents. A negative exponent means take the reciprocal, and any nonzero base raised to the zero power equals 1.

WORKED EXAMPLE

Simplify 7^3 * 7^-5.

1. Add the exponents: 7^(3 + -5)
2. Combine the exponents: 7^-2
3. Rewrite with a positive exponent: 1/7^2 = 1/49

Answer: 1/49

PRACTICE 6 problems

1 Simplify. Write the final answer using positive exponents: 2^4 * 2^-6

ANSWER _____

2 Simplify. Write the final answer using positive exponents: 5^3 / 5^5

ANSWER _____

3 Simplify. Write the final answer using positive exponents: (3^2)^-3

ANSWER _____

4 Simplify. Write the final answer using positive exponents: 4^-2 * 4^5

ANSWER _____

5 Simplify: (6^2)^0

ANSWER _____

6 Simplify. Write the final answer using positive exponents: 10^-3 / 10^1

ANSWER _____

APPLY IT Show your work

1 An audio app uses a scale factor of 9^4 / 9^6 when it saves a sound clip. Write the scale factor as a fraction with positive exponents, then simplify.

WORK SPACE

ANSWER _____

2 At a robotics competition, a team's score multiplier is modeled by (12^-3 * 12^5) / 12^1. What is the multiplier?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Simplify (8^-3 * 8^6)^2 / 8^4. Then explain in one sentence which exponent rules you used.

_____

_____

ANSWER KEY

Exponent Power Moves

GRADE 8 · 8.EE.A.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Simplify. Write the final answer using positive exponents: 2^4 * 2^-6	**1/4**
2	Simplify. Write the final answer using positive exponents: 5^3 / 5^5	**1/25**
3	Simplify. Write the final answer using positive exponents: (3^2)^-3	**1/729**
4	Simplify. Write the final answer using positive exponents: 4^-2 * 4^5	**64**
5	Simplify: (6^2)^0	**1**
6	Simplify. Write the final answer using positive exponents: 10^-3 / 10^1	**1/10000**

PART 2 · APPLY IT

1. **1/81** Subtract the exponents: 9^(4 - 6) = 9^-2. Rewrite the negative exponent as 1/9^2, which equals 1/81.
2. **12** Add exponents in the numerator, then subtract the denominator exponent: 12^(-3 + 5 - 1) = 12^1. The multiplier is 12.

CHALLENGE

64, because multiplying adds exponents, raising a power multiplies exponents, and dividing subtracts exponents.

Accept equivalent intermediate forms, such as 2^-2 before it is rewritten as 1/4. For items that ask for positive exponents, the final answer should be a fraction or whole number with no negative exponent.