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. …"

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

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

WORK SPACE AND ANSWER

ANSWER KEY

Exponent Power Moves

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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.