LESSON MAKER PRO

Exponent Power Moves

Use exponent rules to rewrite expressions efficiently.

HIGH SCHOOL · MA.912.NSO.1.2

MA.912.NSO.1.2 "Generate equivalent algebraic expressions using the properties of exponents."

NAME _____ DATE _____

EXPONENT RULE TOOLKIT

When you multiply powers with the same base, add the exponents. When you divide powers with the same base, subtract the exponents, and when a power is raised to a power, multiply the exponents. A negative exponent means the factor belongs in the denominator of a fraction.

WORKED EXAMPLE

Simplify $(r^7s^{-5})^4$.

1. Apply the power rule: $r^{(7*4)}s^{(-5*4)}$.
2. Multiply the exponents: $r^{28}s^{-20}$.
3. Rewrite the negative exponent in the denominator.

Answer: r^{28}/s^{20}

PRACTICE 6 problems

1 Simplify: $x^8 * x^3$

ANSWER _____

2 Simplify: y^{12}/y^9

ANSWER _____

3 Simplify: $(a^2)^6$

ANSWER _____

4 Rewrite with a positive exponent: b^{-3}

ANSWER _____

5 Simplify: $(2c^3d^8)^3$

ANSWER _____

6 Simplify: $(p^9q^{-2})/(p^3q^6)$

ANSWER _____

APPLY IT Show your work

1 A coding club has 2^3 test cases for each app module. The club builds 2^3 identical modules. Write the total number of test cases as one power of 2.

WORK SPACE

ANSWER _____

2 A student video editor saves 3^2 identical versions of a project. Each version uses 3^8 data units of storage. Write the total storage used as one power of 3.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Simplify and write your answer with positive exponents: $(x^8y^{-3})^2/(x^6y^{-9})$

WORK SPACE AND ANSWER

ANSWER KEY

Exponent Power Moves

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Simplify: $x^8 * x^3$	**x^{11}**
2	Simplify: y^{12}/y^9	**y^3**
3	Simplify: $(a^2)^6$	**a^{12}**
4	Rewrite with a positive exponent: b^{-3}	**$1/b^3$**
5	Simplify: $(2c^3d^8)^3$	**$8c^9d^{24}$**
6	Simplify: $(p^9q^{-2})/(p^3q^6)$	**p^6/q^8**

PART 2 · APPLY IT

1. **2^6** Multiply 2^3 by 2^3 because each of the 2^3 modules has 2^3 test cases. Add the exponents.
2. **3^{10}** Multiply 3^2 versions by 3^8 data units per version. Add the exponents for the common base.

CHALLENGE

$x^{10}y^3$

Accept equivalent products written in a different factor order. For expressions with negative exponents, accept an equivalent reciprocal form, but the requested final form uses positive exponents.