LESSON MAKER PRO

Power Up Numbers

Evaluate powers with fractions, decimals, and negative bases.

GRADE 6 · 6.PAR.6.1

6.PAR.6.1 "Write and evaluate numerical expressions involving rational bases and whole-number exponents."

NAME _____ DATE _____

POWERS OF RATIONAL NUMBERS

A whole-number exponent tells how many times to multiply the base by itself. A rational base can be a fraction, decimal, or integer. When a negative base is in parentheses, an even exponent gives a positive result and an odd exponent gives a negative result.

WORKED EXAMPLE

Evaluate $(-3/5)^3$.

1. The base is -3/5, and the exponent is 3.
2. $(-3/5)^3 = (-3/5) \times (-3/5) \times (-3/5)$
3. $(-3/5) \times (-3/5) = 9/25$
4. $9/25 \times (-3/5) = -27/125$

Answer: -27/125

PRACTICE 6 problems

1 Evaluate $(1/2)^4$.

ANSWER _____

2 Evaluate $(-7)^2$.

ANSWER _____

3 Evaluate $(0.8)^2$.

ANSWER _____

4 Evaluate $(-1/4)^5$.

ANSWER _____

5 Evaluate $(9/2)^2$.

ANSWER _____

6 Evaluate $(-2)^5$.

ANSWER _____

APPLY IT Show your work

1 A square profile-picture frame has a side length of 1/4 inch. Its area can be written as $(1/4)^2$ square inch. What is the area of the frame?

WORK SPACE

ANSWER _____

2 A gamer designs a square controller decal with side length 7/2 inches. The area of the decal is $(7/2)^2$ square inches. What is the area?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Evaluate $(-2/7)^2 \times (7/2)^3$.

WORK SPACE AND ANSWER

ANSWER KEY

Power Up Numbers

GRADE 6 · 6.PAR.6.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Evaluate $(1/2)^4$.	**1/16**
2	Evaluate $(-7)^2$.	**49**
3	Evaluate $(0.8)^2$.	**0.64**
4	Evaluate $(-1/4)^5$.	**-1/1024**
5	Evaluate $(9/2)^2$.	**81/4**
6	Evaluate $(-2)^5$.	**-32**

PART 2 · APPLY IT

1. **1/16 square inch** Square the side length: (1/4) x (1/4) = 1/16.
2. **49/4 square inches, or 12 1/4 square inches** Square the side length: (7/2) x (7/2) = 49/4. Convert 49/4 to 12 1/4 if using a mixed number.

CHALLENGE

7/2

Accept equivalent fraction forms and mixed-number forms where appropriate. For the decimal problem, accept 0.64 or 64/100.