LESSON MAKER PRO

Power and Root Lab

Use exponents and roots to find exact values.

GRADE 8 · 8.EE.A

CCSS.Math.Content.8.EE.A "Work with radicals and integer exponents."

NAME _____ DATE _____

POWERS AND ROOTS

A positive exponent tells how many times the base is multiplied by itself. For a nonzero base, a negative exponent means take the reciprocal: $a^{-n} = 1/a^{n}$. A square root finds a number multiplied by itself, and a cube root finds a number multiplied by itself twice more.

WORKED EXAMPLE

Evaluate 7^{-3}.

1. Use the negative-exponent rule: $7^{-3} = 1/7^{3}$.
2. Multiply: $7^{3} = 343$.
3. Substitute: $1/7^{3} = 1/343$.

Answer: 1/343

PRACTICE 6 problems

1 Evaluate 5^{4}.

ANSWER _____

2 Evaluate sqrt(225).

ANSWER _____

3 Evaluate cube root(512).

ANSWER _____

4 Evaluate $(-4)^{5}$.

ANSWER _____

5 Evaluate 2^{6}.

ANSWER _____

6 Evaluate 9^{2}.

ANSWER _____

APPLY IT Show your work

1 In a game tournament, a score multiplier doubles during each of 8 bonus rounds. The multiplier is represented by 2^8. What is its value?

WORK SPACE

ANSWER _____

2 The art club plans a square floor design with an area of 484 square tiles. How many tiles long is each side?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A square gaming lounge has an area of 2^{10} square feet. What is the length of one side? Explain your reasoning.

WORK SPACE AND ANSWER

ANSWER KEY

Power and Root Lab

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Evaluate 5^4.	**625**
2	Evaluate sqrt(225).	**15**
3	Evaluate cube root(512).	**8**
4	Evaluate $(-4)^5$.	**-1024**
5	Evaluate 2^6.	**64**
6	Evaluate 9^2.	**81**

PART 2 · APPLY IT

1. **256** Evaluate 2^8 by multiplying 2 by itself 8 times. The score multiplier is 256.
2. **22 tiles** Find the square root of the area. Since sqrt(484) = 22, each side is 22 tiles long.

CHALLENGE

32 feet. Since sqrt(2^{10}) = 2^5, the side length is 32 feet.

Accept correctly simplified numerical answers. For the challenge, accept 32 feet with reasoning that the square root of 2^{10} is 2^5.