

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

CHALLENGE

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

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 .