LESSON MAKER PRO

Root Power Practice

Square roots and cube roots of perfect powers

GRADE 8 · 8.EE.A.2

CCSS.Math.Content.8.EE.A.2 "Use square root and cube root symbols to represent solutions to equations of the form x 2 = p and x 3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes..."

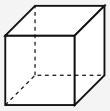
NAME _____ DATE _____

ROOTS UNDO POWERS

For $x^2 = p$, write $x = \pm\sqrt{p}$ because both a positive and a negative number can square to p. For $x^3 = p$, write $x = \sqrt[3]{p}$ because one real number cubes to p. $\sqrt{2}$ is irrational, so it cannot be written as a fraction of integers.

WORKED EXAMPLE

The cube shown has a volume of 1000 cubic units. Its edge length is x units. Find x.



1. A cube with edge length x has volume x^3.
2. Write $x^3 = 1000$.
3. Write $x = \sqrt[3]{1000} = 10$.

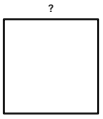
Answer: x = 10 units

PRACTICE 6 problems

1 Solve $x^2 = 49$.

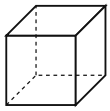
ANSWER _____

2 The square shown has an area of 64 square centimeters. Its side length is x centimeters. Find x.



ANSWER _____

3 The cube shown has a volume of 216 cubic centimeters. Its edge length is x centimeters. Find x.



ANSWER _____

4 Evaluate $\sqrt{(1/4)}$.

ANSWER _____

5 Evaluate $\sqrt[3]{(1/8)}$.

ANSWER _____

6 Evaluate $\sqrt{144}$ and $\sqrt[3]{125}$.

ANSWER _____

APPLY IT Show your work

1 A gaming club stores controller adapters in a cube-shaped case with a volume of 512 cubic centimeters. Each edge has length x centimeters. What is x?

WORK SPACE

ANSWER _____

2 A student is designing a square album cover with an area of 225 square centimeters. Each side has length x centimeters. What is x?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve both equations. Write all solutions for $x^2 = 1/16$, then solve $x^3 = 1/27$.

WORK SPACE AND ANSWER

ANSWER KEY

Root Power Practice

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve $x^2 = 49$.	**x = -7 or x = 7**
2	The square shown has an area of 64 square centimeters. Its side length is x centimeters. Find x.	**x = 8 cm**
3	The cube shown has a volume of 216 cubic centimeters. Its edge length is x centimeters. Find x.	**x = 6 cm**
4	Evaluate $\sqrt{(1/4)}$.	**1/2**
5	Evaluate $\sqrt[3]{(1/8)}$.	**1/2**
6	Evaluate $\sqrt{144}$ and $\sqrt[3]{125}$.	**$\sqrt{144} = 12$; $\sqrt[3]{125} = 5$**

PART 2 · APPLY IT

1. **x = 8 cm** Write $x^3 = 512$. Then $x = \sqrt[3]{512} = 8$.
2. **x = 15 cm** Write $x^2 = 225$. Because a side length is positive, $x = \sqrt{225} = 15$.

CHALLENGE

For $x^2 = 1/16$, x = -1/4 or x = 1/4. For $x^3 = 1/27$, x = 1/3.

Accept equivalent forms such as x = ±7 or x = ±1/4. For square and cube contexts involving lengths, accept only the positive value.