

Get your Calculator

We will learn how to find
cubes and cube roots

Take 3-4 minutes to create

Take out your

a cube and cube root page!

You need these numbers to
work through the lesson!

Hint: use your square root
and cube root cheat sheets

Work with a partner.

Be ready to share your answers.

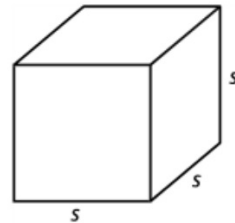
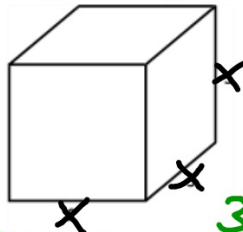
Your friend says that $\sqrt{169}$ is 13. Another friend says that $\sqrt{169}$ is -13 . Who is correct? Explain.

~~$\sqrt{169}$~~

Find the edge length of the cube.

1. Volume = $64,000 \text{ ft}^3$ 2. Volume = $\frac{1}{216} \text{ ft}^3$

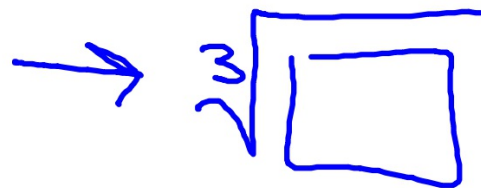
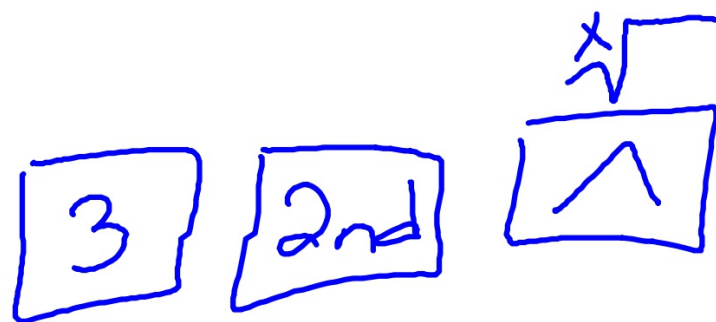
$V = x^3$



$\sqrt[3]{64000} = x$

$40 = x$

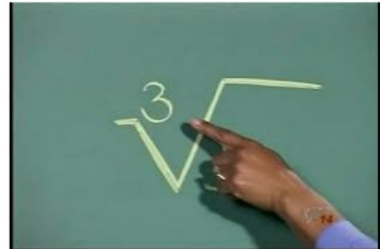
$\sqrt[3]{\frac{1}{216}} = \frac{1}{6}$



7.2 Cube Roots






Learning Targets

- Finding Cube Roots
- Evaluating Expressions
- Evaluating Algebraic Expressions







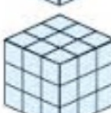

Square Root

$1^2 = 1$		$\sqrt{1} = 1$
$2^2 = 4$		$\sqrt{4} = 2$
$3^2 = 9$		$\sqrt{9} = 3$
$4^2 = 16$		$\sqrt{16} = 4$
$5^2 = 25$		$\sqrt{25} = 5$

This is why we say Square and Square Root!



Cube Root

	1 is the first cube number, because $1 \times 1 \times 1 = 1$
	8 is the second cube number, because $2 \times 2 \times 2 = 8$
	27 is the third cube number, because $3 \times 3 \times 3 = 27$
	64 is the fourth cube number, because $4 \times 4 \times 4 = 64$

This is why we say Cube and Cube Root!

Some Important Definitions

A cube root of a number is a number that, when multiplied by itself 3 times, equals a given number.

$$\sqrt[3]{64} = 4 * 4 * 4; \text{ so the cuberoot of } 64 = 4$$

A perfect cube is a number that can be written as a cube of an integer. Examples: 27, 64, 125

The symbol $\sqrt[3]{x}$ is used to represent a cube root.

Finding Cube Roots on a Calculator

Cubes

$$1^3 = 1 * 1 * 1 = 1$$

$$2^3 = 2 * 2 * 2 = 8$$

$$3^3 = 3 * 3 * 3 = 27$$

Cube Roots

$$\sqrt[3]{1} = 1$$

$$\sqrt[3]{8} = 2$$

$$\sqrt[3]{27} = 3$$

You can't have a negative Square

$$5^2 = 5 * 5 = 25 = (-5)(-5)$$

$$(-4)^2 = (-4)(-4) = 16$$

perfect squares are
always positive

$$\cancel{\sqrt{-25}}$$

But you **CAN** have a negative Cube!

$$(-3)^3 = (-3)(-3)(-3) = -27$$

+ · -

$$\boxed{\sqrt[3]{-27} = -3}$$

Find each cube root.

a. $\sqrt[3]{8}$



2

b. $\sqrt[3]{-27}$



-3

c. $\sqrt[3]{\frac{1}{64}}$



$\frac{1}{4}$

Find the cube root

1. $\sqrt[3]{-343}$

-7

2. $\sqrt[3]{-\frac{27}{1000}}$

$-\frac{3}{10}$

Quick PEMDAS Review

P

Anything in **Parentheses**

E

Exponents and **Roots!** (*new)

MD

From **LEFT** to **RIGHT**, **multiplication** and **division**

AS

From **LEFT** to **RIGHT**, **addition** and **subtraction**

G Grouping { [()] }

E Exponents/Roots

M Multiplication/Division

S Subtraction/Addition

Evaluate an expression

$$2 \cdot \sqrt[3]{-216} - 3$$

$$\begin{aligned} 2(-6) - 3 \\ -12 - 3 \\ -15 \end{aligned}$$

$$(\sqrt[3]{125}) + 21$$

$$\begin{aligned} 5^3 + 21 \\ 125 + 21 \\ 146 \end{aligned}$$

Use your Cube Root
Cheat Sheet!

$$\begin{aligned} (\sqrt[3]{64}) \\ 64 \end{aligned}$$

Evaluate an expression

Evaluate the expression.

4. $18 - 4\sqrt[3]{8}$

10

$$18 - 4 \cdot 2$$

$$18 - 8$$

10

5. $(\sqrt[3]{-64})^3 + 43$

-21

$$-64 + 43$$

$$-21$$

6. $5\sqrt[3]{512} - 19$

21

$$5(8) - 19$$

$$40 - 19$$

21

Evaluate $\frac{x}{4} + \sqrt[3]{\frac{x}{3}}$ when $x = 192$.

$48 + 4$
Work with a partner to
come up with a plan to
evaluate this question.

52

Evaluate $\frac{x}{4} + \sqrt[3]{\frac{x}{3}}$ when $x = 192$.

Homework

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1-5, 6-22 even

23-25, & 27