

Name: _____

Date: _____

Cube Roots Algebra (Grade 8)

When you multiply a number by itself twice, you cube the number.

Symbol for cubing is the exponent 3. $\rightarrow 4^3 = 4 \cdot 4 \cdot 4 = 64$ 4 cubed is 64.

To "undo" this, take the *cube root* of the number.

Symbol for cube root is $\sqrt[3]{\quad}$. $\rightarrow \sqrt[3]{64} = \sqrt[3]{4^3} = 4$ The cube root of 64 is 4.

Examples of Perfect Cubes				
$1^3 = 1$	$4^3 = 64$			
$2^3 = 8$	$5^3 = 125$			
$3^3 = 27$				

Examples of Cube Roots				
$\sqrt[3]{1} = 1$	$\sqrt[3]{64} =$			
$\sqrt[3]{8} =$	$\sqrt[3]{125} =$			
$\sqrt[3]{27} =$				

You should become familiar with recognizing **perfect cubes** without a calculator. Sometimes you will need your calculator to compute cube roots.

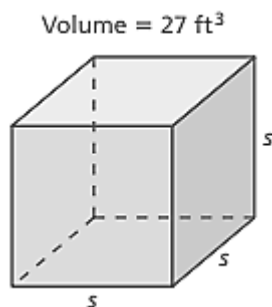
A **cube root** of a number is a number that, when multiplied by itself, and then multiplied by itself again, equals the given number. A **perfect cube** is a number that can be written as the cube of an integer. The symbol $\sqrt[3]{\quad}$ is used to represent a cube root.

Exercise #1: Find the cube root. **Do not use a calculator.**

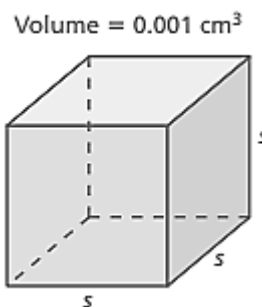
a. $\sqrt[3]{27}$ b. $\sqrt[3]{125} =$ c. $\sqrt[3]{0} =$ d. $\sqrt[3]{-8} =$ e. $\sqrt[3]{-1} =$ f. $\sqrt[3]{-64} =$

Exercise #2:

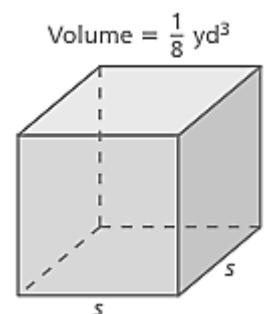
a.



b.



c.



Exercise #3:

Evaluate each expression.

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

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

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

Exercise #4:

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

Exercise #6: a. Compute 5^3 and $(-5)^3$. What does this tell us about cubing numbers and finding cube roots?

b. Look at $\sqrt{-64}$ and $\sqrt[3]{-64}$. Which one is possible and which one is impossible.

Exercise #7:

Evaluate the expression for the given value of the variable.

$$\sqrt[3]{8y} + y, y = 64$$

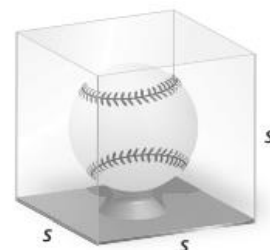
$$2b - \sqrt[3]{9b}, b = -3$$

Exercise #8:

a.

Find the surface area of the baseball display case.

The baseball display case is in the shape of a cube. Use the formula for the volume of a cube to find the edge length s .



Volume = 125 in.^3

b.

The volume of a music box that is shaped like a cube is 512 cubic centimeters. Find the surface area of the music box.