## Lesson 12: Edge Lengths and Volumes

Let’s explore the relationship between volume and edge lengths of cubes.

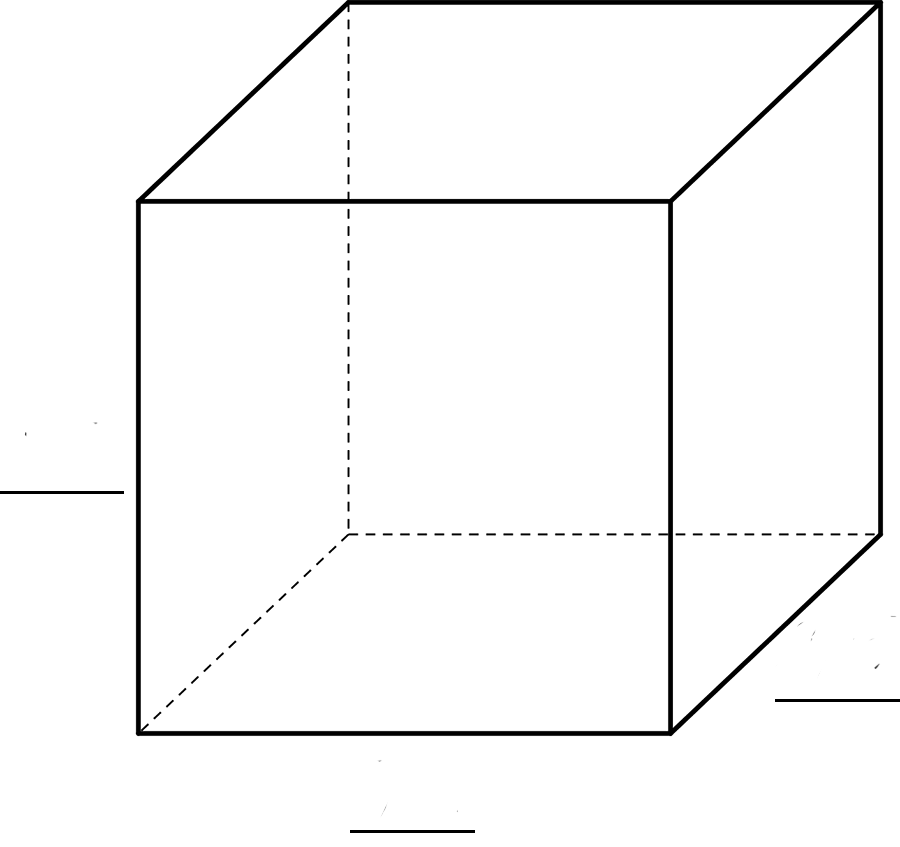
### 12.1: Ordering Squares and Cubes

Let , , , , , and be positive numbers.

Given these equations, arrange , , , , , and from least to greatest. Explain your reasoning.

### 12.2: Name That Edge Length!

Fill in the missing values using the information provided:



| sides | volume | volume equation |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

#### Are you ready for more?

A cube has a volume of 8 cubic centimeters. A square has the same value for its area as the value for the surface area of the cube. How long is each side of the square?

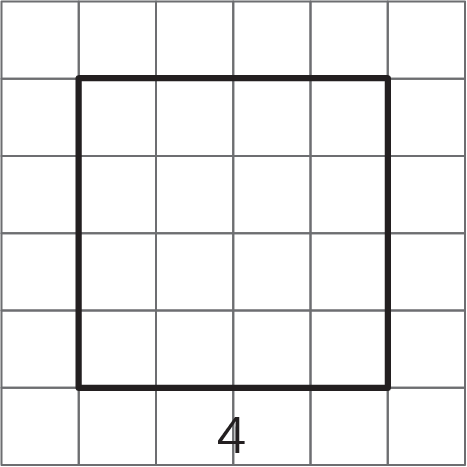
### 12.3: Card Sort: Rooted in the Number Line

Your teacher will give your group a set of cards. For each card with a letter and value, find the two other cards that match. One shows the location on a number line where the value exists, and the other shows an equation that the value satisfies. Be prepared to explain your reasoning.

### Lesson 12 Summary

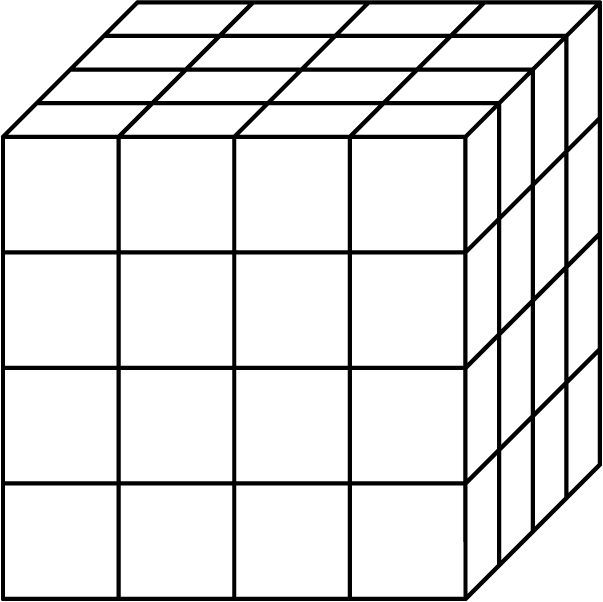
To review, the side length of the square is the square root of its area. In this diagram, the square has an area of 16 units and a side length of 4 units.

These equations are both true:



Now think about a solid cube. The cube has a volume, and the edge length of the cube is called the **cube root** of its volume. In this diagram, the cube has a volume of 64 units and an edge length of 4 units:

These equations are both true:



is pronounced “The cube root of 64.” Here are some other values of cube roots:

, because

, because

, because



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