## Lesson 2: Square Roots and Cube Roots

* Let’s think about square and cube roots.

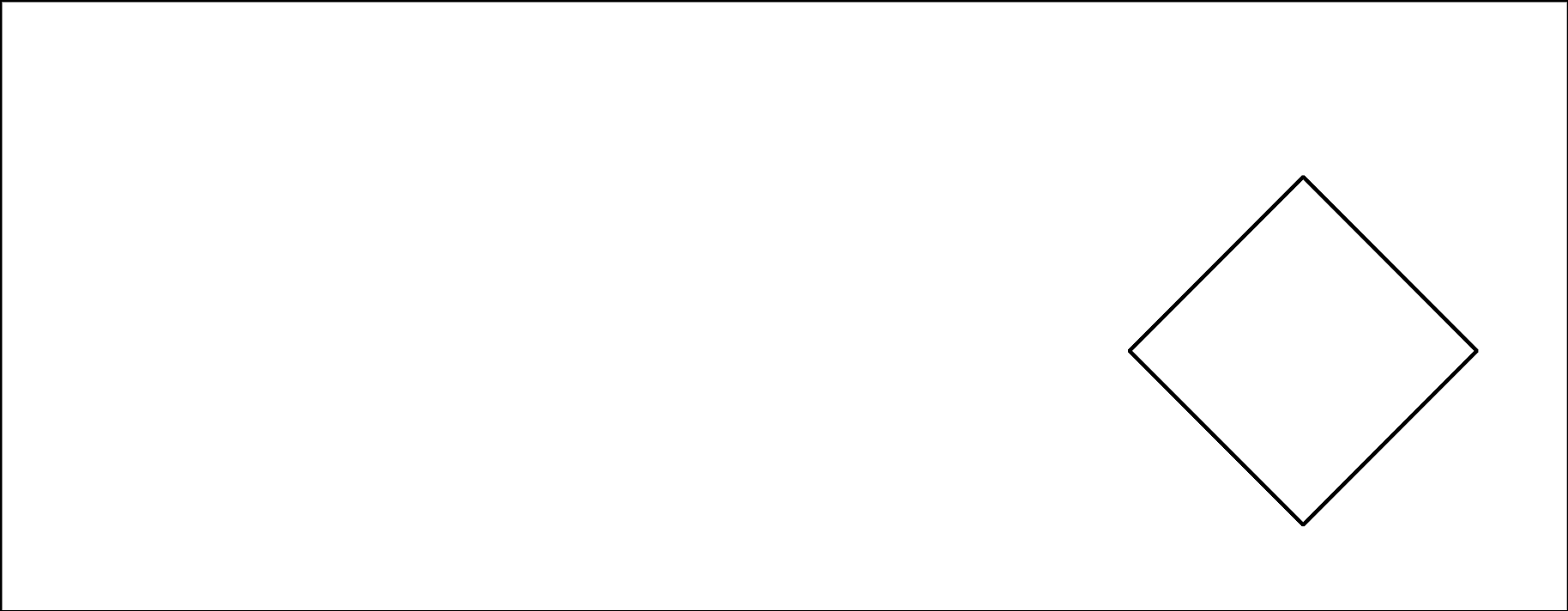
### 2.1: It’s a Square

Find the area of square .



### 2.2: Squares and Their Side Lengths

1. Complete the table with the area of each square in square units, and its exact side length in units.

* 

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| * figure | * A | * B | * C | * D | * E |
| * area |  |  |  |  |  |
| * side length |  |  |  |  |  |

1. This table includes areas in square units and side lengths in units of some more squares. Complete the table.

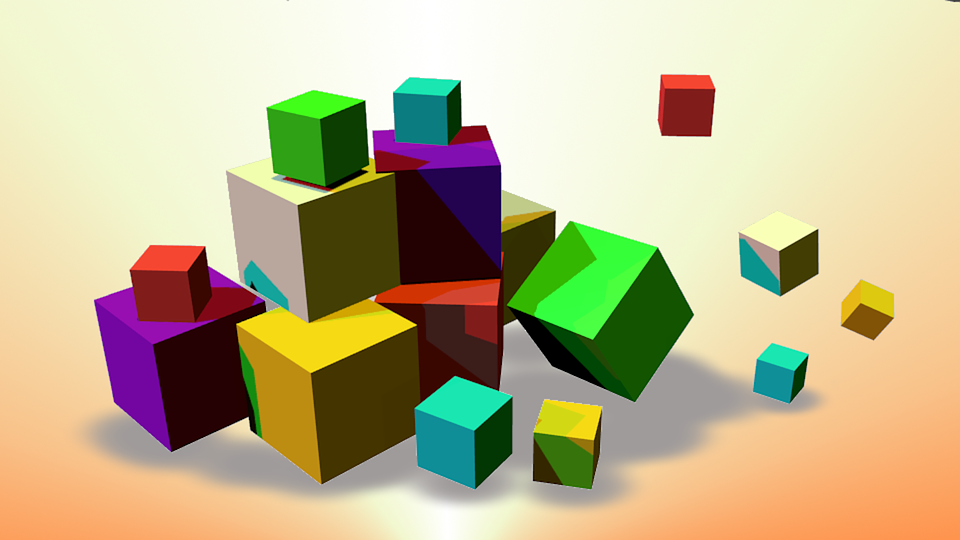
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| * area | * 9 |  | * 23 |  | * 89 |
| * side length |  | * 4 |  | * 6.4 |  |

#### Are you ready for more?

In the first question, all of the squares have vertices at grid points.

1. Is there a square whose vertices are at grid points and whose area is 7 square units? Explain how you know.
2. Is there a square whose vertices are at grid points and whose area is 10 square units? Explain how you know.

### 2.3: Cube It



1. A cube has edge length 3 units. What is the volume of the cube?
2. A cube has edge length 4 units. What is the volume of the cube?
3. A cube has volume 8 units. What is the edge length of the cube?
4. A cube has volume 7 units. What is the edge length of the cube?
5. is between 10 and 11 because and . Determine the whole numbers that each of these cube roots lies between:

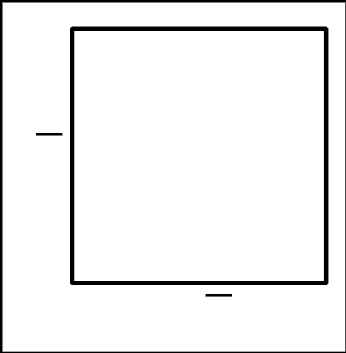
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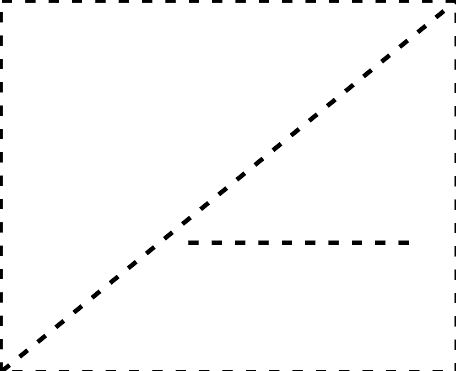
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| between | 1 and 2 | 2 and 3 | 3 and 4 | 4 and 5 | 5 and 6 | 6 and 7 | 7 and 8 | 8 and 9 |
|  |  |  |  |  |  |  |  |  |

### Lesson 2 Summary

If a square has side length , then the area is . If a square has area , then the side length is . For a positive number , the square root of is defined as the positive number that squares to make , and it is written as . In other words, . We can also think of as a solution to the equation . This square has an area of because its sides have length :



Similarly, if a cube has edge length , then the volume is . If a cube has volume , then the edge length is . The number is defined as the number that cubes to make . In other words, . We can also think of as a solution to the equation . This cube has a volume of because its sides have length :





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