Square Roots

The **square** of a number is that number multiplied by itself:

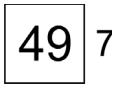
$$\text{six squared} = 6^2 = 6 \cdot 6 = 36$$

Simply put, the square of 6 tells you the area of a square with sides 6 units long.

Taking a **square root** is the opposite operation to squaring. For example, the square root of 36 is 6. This operation goes the opposite way: if you know the area of a square, then you can find the length of its side.

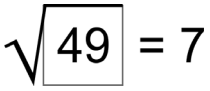
We use the "$\sqrt{\ }$" symbol (called the "radical") to signify "square root."
For example, $\sqrt{25} = 5$ because $5^2 = 25$.

Here is a way to remember what a square root is. In the picture on the right, the area of a square is written inside the square and the length of the side is written to the side:



Now, imagine the square is a square root symbol that "houses" the number for the area:

To find a square root of a number, think of a square with that area, and find the length of the side of that square.



1. Find the square roots.

a. $\sqrt{100}$	**b.** $\sqrt{64}$	**c.** $\sqrt{4}$	**d.** $\sqrt{0}$
e. $\sqrt{81}$	**f.** $\sqrt{144}$	**g.** $\sqrt{1}$	**h.** $\sqrt{10{,}000}$

2. It is especially easy to find square roots of numbers that are **perfect squares:** numbers we get by squaring whole numbers. For example, 49 is a perfect square because it is 7^2. Fill in the list of perfect squares from 1^2 to 20^2 at the right:

3. Now find these square roots. You can use the table at the right or guess and check.

a. $\sqrt{169}$ **b.** $\sqrt{900}$

c. $\sqrt{225}$ **d.** $\sqrt{121}$

e. $\sqrt{441}$ **f.** $\sqrt{8{,}100}$

Perfect squares	
1	_____
4	_____
9	169
16	196
25	_____
36	256
49	289
_____	324
_____	361
_____	400

4. Solve and find a shortcut for simplifying expressions of the form $\sqrt{a^2}$.

a. $\sqrt{6 \cdot 6}$	**b.** $\sqrt{7^2}$	**c.** $\sqrt{57^2}$	**d.** $\sqrt{0.29^2}$

Fill in the shortcuts: Since squaring and square root are opposite operations,

$(\sqrt{a})^2 =$ ____ and $\sqrt{a^2} =$ ____ for any positive number a.