

Algebra 1 Sem. 2  
Lesson: April 7th, 2020

**Learning Target:**

Students will solve a quadratic equation using the square root method.

**In Today's Lesson You Will:**

- Warm-up: Connect old with new concepts
- Watch a video lesson about today's topic
- Individual practice (support provided)
- Self Assessment (key included)

## Warm-up:

Solve for  $x$ .

$$5x - 7 = 18$$

$$x^2 = 9$$

## Warm-up (key):

Solve for x.

$$5x - 7 = 18$$

$$+7 \quad +7$$

Get the x term by itself by adding 7 to both sides

$$5x = 25$$

$$\frac{5x}{5} = \frac{25}{5}$$

Divide by 5 on both sides

$$x = 5$$

$$x^2 = 9$$

$$\sqrt{x^2} = \pm\sqrt{9}$$

$$x = 3 \text{ and } -3$$

Check:  $3 \cdot 3 = 9$

$$-3 \cdot -3 = 9$$

**Square root both sides.** This will give you a positive and negative solution

## Watch this Video Lesson:

### Solving a Quadratic Using the Square Root Method

In this video you will learn:

- What a quadratic equation looks like
- What a quadratic graph can look like
- The number of solutions a quadratic can have
- How to find the solutions using the Square Root Method

# Practice

Go to this website:

## [Solve a quadratic using square root method](#)

1. Review and solve the problems on [Solve a quadratic using square root method](#)
2. When you square root a number, there will be two solutions (one positive, one negative). For example:

Solve for  $r$ .

$$r^2 = 36$$

$$r = \pm\sqrt{36}$$

*Take the square root*

$$r = \pm 6$$

*Simplify*

$$r = 6 \text{ or } r = -6$$

*Split  $\pm$  into + or -*

**Why is the answer both 6 and -6?**

**Because  $6 \times 6 = 36$**

**AND**

**$-6 \times -6 = 36$**

3. The solutions you get when you solve the quadratic are the x-intercepts or zeros of the parabola. See example with graph below:

Solve for  $r$ .

$$r^2 = 36$$

$$r = \pm\sqrt{36}$$

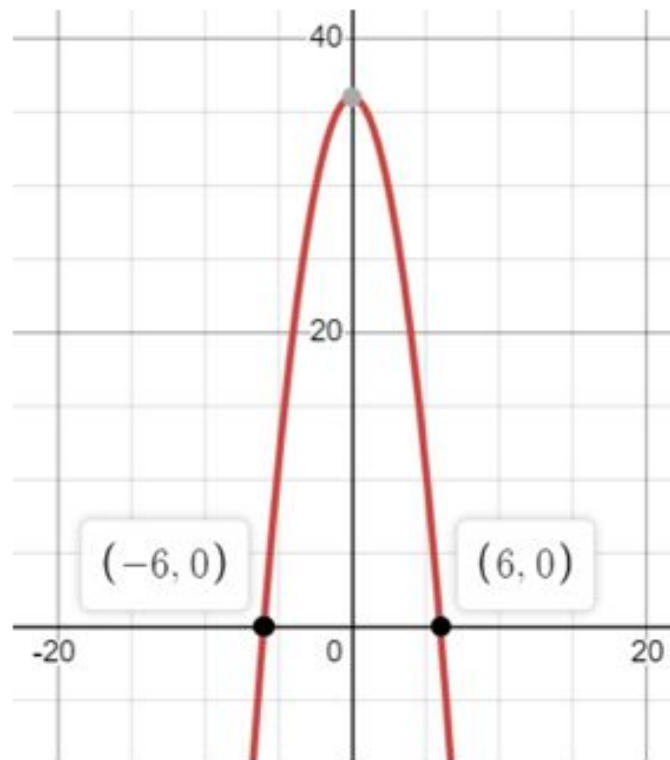
*Take the square root*

$$r = \pm 6$$

*Simplify*

$$r = 6 \text{ or } r = -6$$

*Split  $\pm$  into + or -*



# More Practice

Go to this website:

## [Solving a quadratic function using square root method](#)

1. Review and solve the problems on [Solving a quadratic function using square root method](#)  
**Note:** The “smaller x” will be the negative solution and the “larger x” will be the positive solution
2. You may see a problem that is written in *function form* like this:

$$g(x) = -10x^2 + 490$$

$$-10x^2 + 490 = 0$$

First, set the function equal to zero

$$-10x^2 = -490$$

Then isolate the variable (the term with x).  
I subtracted 490 on both sides.

$$x^2 = 49$$

I divided both sides by -10 to get to this step

The last step is not shown. Just square root 49 to get  $x = 7$  and  $-7$

# Self Assess: Try these on your own, then check with the key.

Solve each quadratic equation.

1.  $x^2 = 16$

2.  $2x^2 = 50$

3.  $x^2 - 25 = -21$

4.  $3x^2 + 2 = 29$

5.  $-6x^2 = -216$

6.  $3 - 4x^2 = -193$

Create a quadratic equation that would have solutions of 4 and -4.



# Answer Key:

Once you have completed the problems, check your answers here.

Solve each quadratic equation.

1.  $x^2 = 16$

$x = 4, -4$

2.  $2x^2 = 50$

$x = 5, -5$

3.  $x^2 - 25 = -21$

$x = 2, -2$

4.  $3x^2 + 2 = 29$

$x = 3, -3$

5.  $-6x^2 = -216$

$x = 6, -6$

6.  $3 - 4x^2 = -193$

$x = 7, -7$

Create a quadratic equation that would have solutions of 4 and -4.

There are many possible answers.  
Here is just one example.

$x^2 + 7 = 23$