

## Warm-up!

Solve the following equations:

a.  $\sqrt{x^2} = 25$   
 $x = \pm 5$

b.  $\sqrt{x^2} = 81$   
 $x = \pm 9$

c.  $\frac{1}{3}3x^2 = 48$   
 $x^2 = 16$   
 $x = \pm 4$

## 9.4 Use Square Roots to Solve Quadratic Equations

**Before**

You solved a quadratic equation by graphing.

**Now**

You will solve a quadratic equation by finding square roots.

**Why?**

So you can solve a problem about a falling object, as in Example 5.



**GOAL:** Use square roots to solve quadratic equations.

What are we doing  
today?

Solving equations,  
except adding a new  
twist: square roots!

Two Easier Ones!

Example 1:

$$\frac{1}{2} 2x^2 = 32 \cdot \frac{1}{2}$$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

..and of course!

Example 2

$$\frac{1}{6} 6a^2 = 216 \frac{1}{4}$$

$$A^2 = 36$$

$$A = \pm 6$$

Now What?

Example 3:

$$\sqrt{y^2} = \sqrt{18}$$

$$y = \pm \sqrt{18}$$

$$y = \pm 4.24$$

Now What?

Example 4:

$$\sqrt{x^2} = \sqrt{50}$$

$$x = \pm \sqrt{50}$$

$$x = \pm 7.07$$

Now What?

Example 5:

$$\frac{1}{6} 6a^2 = 72 \frac{1}{6}$$
$$\sqrt{A^2} = \sqrt{12}$$

$$A = \pm \sqrt{12}$$
$$A = \pm 3.46$$



### Example 6: Adding a Step

$$11 + 3x^2 - 11 = 7 + 11$$

$$\frac{1}{3} 3x^2 = 18 \frac{1}{3}$$

$$\sqrt{x^2} = \sqrt{6}$$

$$x = \pm \sqrt{6}$$

$$x = \pm 2.44$$

Example 7: You can do it!

$$24 \pm 12x^2 - 24 = 36 + 24$$

$$\frac{1}{12} | 12x^2 = 60, \frac{1}{2}$$

$$\sqrt{x^2} = \sqrt{5}$$

$$x = \pm \sqrt{5}$$

$$x = \pm 2.23$$

Next 2-More Difficult!

Example 8

$$\frac{1}{2} 3(2n - 11) = 75 \cdot \frac{1}{3}$$

$$\sqrt{(2n - 11)} = \sqrt{25}$$

$$\begin{aligned} 11 + 2n - 11 &= \pm 5 + 11 \\ \frac{1}{2} 2n &= (\pm 5 + 11) \frac{1}{2} \\ &\quad \underline{+ 5 + 11} \end{aligned}$$

$$\begin{aligned} n &= 2 \\ n &= 8, 3 \end{aligned}$$

### Example 9

$$\frac{1}{6} \cdot 6(4n - 3)^2 = 54 \cdot \frac{1}{6}$$

$$\sqrt{(4n - 3)^2} = \sqrt{9}$$

$$4n - 3 = \pm 3$$

$$\frac{1}{4} 4n = (\pm 3 + 3) \cdot \frac{1}{4}$$

$$n = \frac{\pm 3 + 3}{4}$$



## Homework

Section 9.4: pages 597-598

#'s 6,10,12,32,34,36

