Section 10.1

Solving Quadratic Equations by the Square Root Property

# Objective 1: Using the Square Root Property

Consider the quadratic equation $x^{2}-4=0$. We can solve this equation by factoring and applying the zero factor property. In this section, we will consider another way to solve quadratic equations of this form. First, add $4$ to both sides of the equation.

$$x^{2}-4=0$$

$$x^{2}=4$$

Now, we see that the value of $x$ must be a number whose square is $4$. There are two such numbers.

$x=\sqrt{4}=2$ or $x=-\sqrt{4}=-2$

**Square Root Property:**

If $x^{2}=a$ for $a\geq 0$, then $x=\sqrt{a}$ or $x=-\sqrt{a}$.

Use the square root property to solve the quadratic equation. Simplify all radicals and rationalize denominators.

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| a. $x^{2}=27$ | b. $x^{2}-7=0$ |
| c. $81x^{2}=1$ | d. $3x^{2}-5=0$ |
| e. $\left(x-4\right)^{2}=36$ | f. $\left(2x+1\right)^{2}=32$ |

# Objective 2: Solving Problems Modeled by Quadratic Equations

If a circle has an area of $196π$ square inches, what is the radius of the circle?