4.2 Solving Quadratics using square roots  

Number of Solutions of $x^2 = c$

*If $c$ is positive in the equation $x^2 = c$, there are two solutions $x = \pm \sqrt{c}$

*If $c = 0$, there is one solution $x = 0$

*If $c$ is negative in the equation $x^2 = c$, there are no real solutions

Practice:  

a) $5x^2 = 125$  

$$\frac{5}{5}$$

$$\sqrt{x^2} = \sqrt{125}$$

$$x = \pm 5$$

b) $-4x^2 - 16 = 0$

$$\frac{-16}{-4}$$

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

No real Solution

Ex 1: A rescue helicopter drops a raft from 40 ft. The raft being dropped is represented by $h(t) = -16t^2 + 40$. About how long does it take to hit the water?

$$0 = -16t^2 + 40$$

$$-40 = -16t^2$$

$$\frac{-40}{-16} = t^2$$

$$\sqrt{2.5} = \sqrt{t^2}$$

$$t = \pm 1.6$$

The raft takes 1.6 seconds to hit the water.

Try it... Solve each equation by finding the square root

a) $81x^2 - 36 = 0$

$$\frac{36}{36}$$

$$81x^2 = 36$$

$$\sqrt{81} \sqrt{36}$$

$$x = \pm \frac{4}{9}$$

or simplest radical form

$$x = \pm 2 \sqrt{3}$$ or $\pm 0.67$

b) $7x^2 - 9 = 75$

$$\frac{75}{7}$$

$$7x^2 = 84$$

$$\sqrt{7} \sqrt{84}$$

$$x = \pm 3.41$$