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) $\dfrac{5x^2}{5} = \dfrac{125}{5}$

$\sqrt{x^2} = \sqrt{25}$

$\boxed{x = \pm 5}$

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

$+16 \quad +16$

$\dfrac{-4x^2}{-4} = \dfrac{16}{-4}$

$\sqrt{x^2} = \sqrt{-4}$ $\boxed{\text{No real Solution}}$

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

$0 = -16t^2 + 40$

$-40 \qquad\qquad -40$

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

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

$t = \pm 1.6$

$\boxed{\text{The raft takes 1.6 seconds to hit the water}}$

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

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

$+36 \quad +36$

$\dfrac{81x^2}{81} = \dfrac{36}{81}$

$\sqrt{x^2} = \sqrt{36/81}$

$x = \pm \dfrac{6}{9}$

$x = \pm 2/3 \text{ or } \pm 0.67$

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

$+9 \quad +9$

$\dfrac{7x^2}{7} = \dfrac{84}{7}$

$\sqrt{x^2} = \sqrt{12}$

$x = \pm 3.46$

or simplest radical form

$\sqrt{12}$ ... 4 ... 3 ... 2 ... 2

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