

## 4.5 Solving Quadratics with the Quadratic Formula

Quadratic Formula:  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ , where  $ax^2 + bx + c = 0$

Ex 1: Solve  $h(t) = -16t^2 + 19t + 6$  using the quadratic formula

$$a = -16$$

$$b = 19$$

$$c = 6$$

$$x = \frac{-19 \pm \sqrt{(19)^2 - 4(-16)(6)}}{2(-16)}$$

$$= \frac{-19 \pm \sqrt{745}}{-32}$$

$$\begin{array}{l} \swarrow \quad \searrow \\ \frac{-19 + \sqrt{745}}{-32} \quad \frac{-19 - \sqrt{745}}{-32} \end{array}$$

$$-0.26$$

$$1.45$$

$$\boxed{x = -0.26 \text{ and } 1.45}$$

**\*DON'T  
ROUND TILL  
THE VERY  
END**

You try...

a)  $x^2 - 4x - 21 = 0$

$$x = \frac{4 \pm \sqrt{(-4)^2 - 4(1)(-21)}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{100}}{2}$$

$$\frac{4 + \sqrt{100}}{2}$$

$$\boxed{x = 7}$$

$$\frac{4 - \sqrt{100}}{2}$$

$$\boxed{x = -3}$$

b)  $6x^2 + 13x + 6 = 0$

$$x = \frac{-13 \pm \sqrt{13^2 - 4(6)(6)}}{2(6)}$$

$$= \frac{-13 \pm \sqrt{25}}{12}$$

$$\frac{-13 + \sqrt{25}}{12}$$

$$\boxed{x = -0.6 \text{ and } -1.5}$$

$$\frac{-13 - \sqrt{25}}{12}$$

c)  $2x^2 + x - 28 = 0$

$$x = \frac{-1 \pm \sqrt{(1)^2 - 4(2)(-28)}}{2(2)}$$

$$= \frac{-1 \pm \sqrt{225}}{4}$$

$$= \frac{-1 \pm 15}{4}$$

$$x = \frac{-1 + 15}{4} = \boxed{3.5}$$

$$x = \frac{-1 - 15}{4} = \boxed{-4}$$