

Applications of Quadratic Equations

$$h(t) = -16t^2 + v_0 t + h_0$$

Example #1

- ① Write a function

$$h(t) = -16t^2 + 32t$$

- ② Write/solve an equation to answer the question.

$$-16t^2 + 32t = 0$$

$$-16t(t - 2) = 0$$

$$-16t = 0$$

$$t = 0$$

seconds

$$t - 2 = 0$$

$$t = 2$$

seconds

2 seconds

$$\#2 \quad h(t) = 73 - 16t^2$$

$$-16t^2 + 73 = 9$$

$$\frac{-16t^2}{-16} = \frac{-64}{-16}$$

$$\sqrt{t^2} = \sqrt{4}$$

$$t = \pm 2$$

2 seconds

$$\#3 \quad h(t) = -16t^2 + 22t + 3$$

$$-16t^2 + 22t + 3 = 0$$

$$t = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-22 \pm \sqrt{22^2 - 4(-16)(3)}}{2(-16)}$$

$$= \frac{-22 \pm \sqrt{676}}{-32} = \frac{-22 \pm 26}{-32}$$

$$t = -0.125s, 1.5 \text{ sec}$$