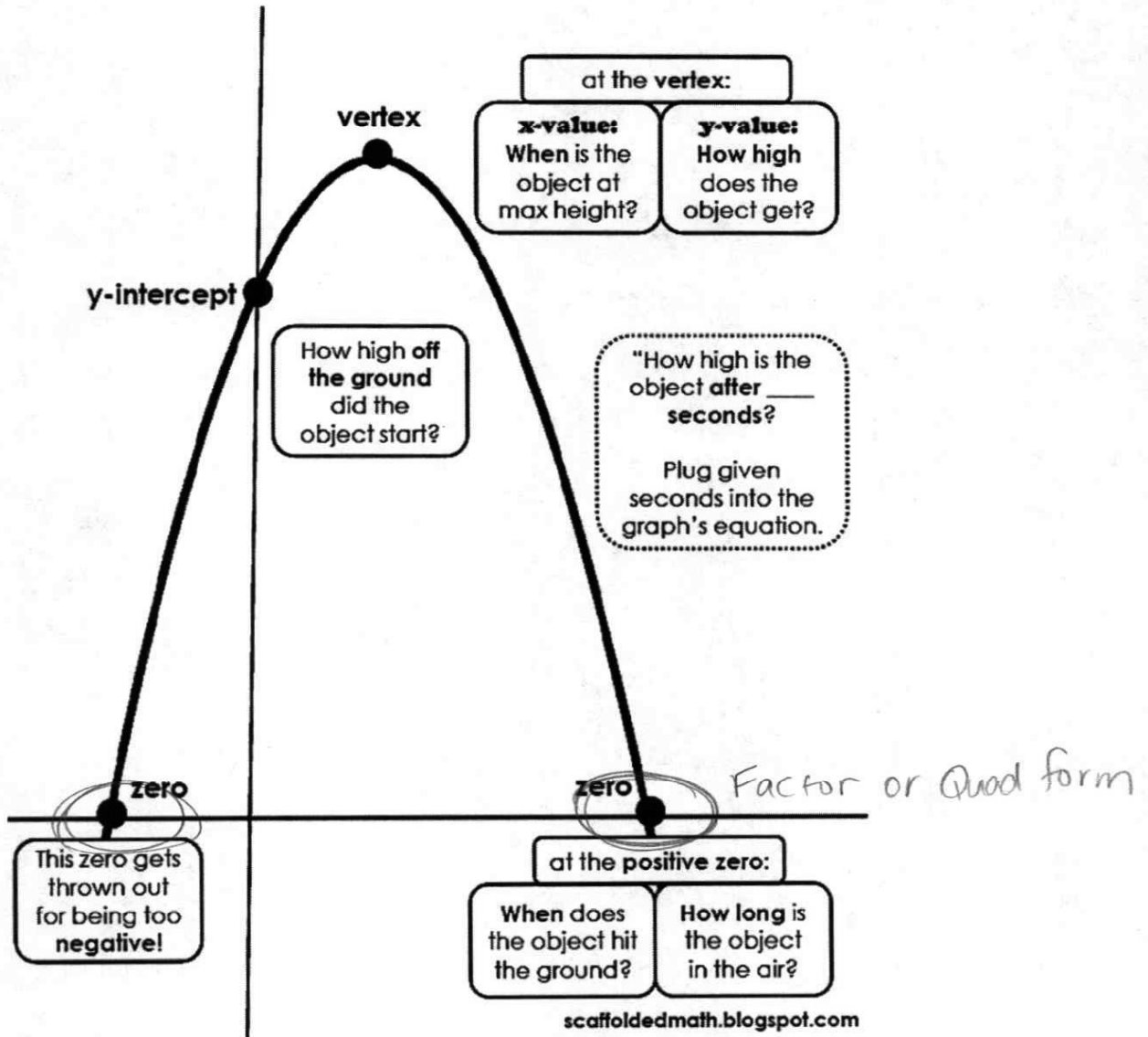


# Quadratic Keywords



Scenario 1:  $h(t) = -12t^2 + 40t + 5$

a. When will it return to the ground?

$$h(t) = 0 \quad y = 0$$

$$0 = -12t^2 + 40t + 5$$

$$\bullet b^2 - 4ac \rightarrow (40)^2 - 4(-12)(5) \rightarrow 1840$$

$$\bullet x = \frac{-40 \pm \sqrt{1840}}{2(-12)} \rightarrow \frac{-40 \pm \sqrt{1840}}{-24}$$

$$\begin{array}{cc} \swarrow & \searrow \\ \cancel{-0.12} & 3.45 \\ \text{sec} & \text{sec} \end{array}$$

Ball hits the ground at 3.45 sec.

b. When will it be 25 feet

$$25 = -12t^2 + 40t + 5$$

$$\frac{-25 \quad -25}{-25 \quad -25}$$

$$0 = -12t^2 + 40t - 20$$

$$\bullet b^2 - 4ac \rightarrow (40)^2 - 4(-12)(-20) \rightarrow 640$$

$$\bullet x = \frac{-40 \pm \sqrt{640}}{2(-12)} \rightarrow \frac{-40 \pm \sqrt{640}}{-24}$$

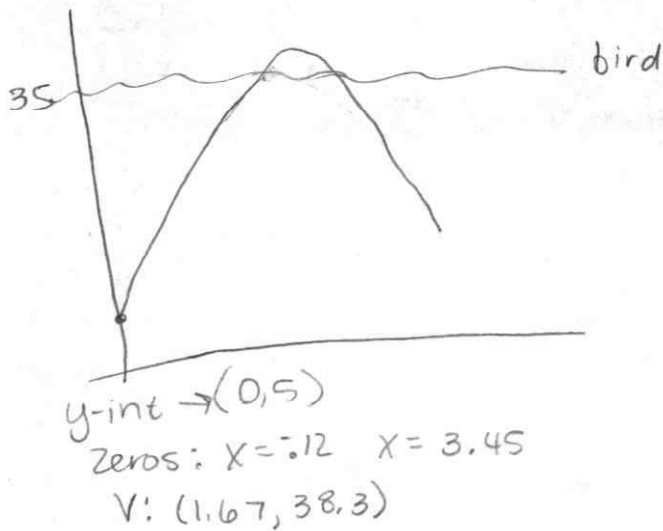
$$\boxed{0.61 \text{ ft} \quad \& \quad 2.72 \text{ ft}}$$

c.  $x = \frac{-b}{2a} \rightarrow \frac{-40}{2(-12)} \rightarrow \frac{-40}{-24} \rightarrow 1.67$

$$y = -12(1.67)^2 + 40(1.67) + 5$$

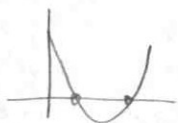
$$y = 38.3$$

Yes the ball goes up to the height of the bird  
( $38.3 > 35$ )



Scenario 2:  $y = 2.5x^2 - 10.5x + 7$

a. Find zeros: Quad form



$$x = \frac{10.5 \pm \sqrt{(-10.5)^2 - 4(2.5)(7)}}{2(2.5)}$$

$$x = \frac{10.5 \pm \sqrt{40}}{5}$$

3.36      .84

b. when will it be 2 ft underwater

$$y = 2$$

$$2 = 2.5x^2 - 10.5x + 7$$

$$-2$$

$$0 = 2.5x^2 - 10.5x + 5$$

① Set = 0

② Quad Form

$$x = \frac{10.5 \pm \sqrt{(-10.5)^2 - 4(2.5)(5)}}{2(2.5)}$$

$$x = \frac{10.5 \pm \sqrt{60}}{5}$$

3.65      .55

c.  $x = \frac{-b}{2a} \rightarrow x = \frac{10.5}{2(2.5)} \rightarrow 2.1$

$$y = 2.5(2.1)^2 - 10.5(2.1) + 7$$

$$y = -4.025$$

The bird dips 4.025 below the surface

no the bird will not catch the fish b/c the fish is 5' below