Quadratic word problems

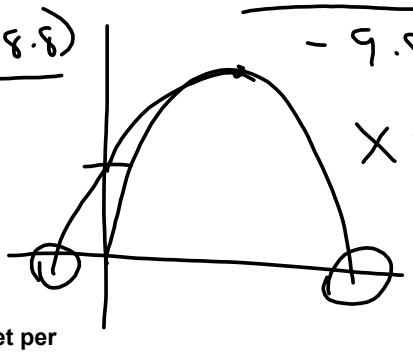
An object is launched at 19.6 meters per second (m/s) from a 58.8-meter tall platform. The equation for the object's height s at time t seconds after launch is $s(t) = -4.9t^2 + 19.6t + 58.8$, where s is in meters. When does the object strike the ground?

$$x = \frac{-19.6 \pm \sqrt{19.6^2 - 4(-4.9)(58.8)}}{2(-4.9)}$$

$$x = \frac{-19.6 \pm 39.2}{-9.8}$$

$$\frac{-19.6 - 39.2}{-9.8}$$

$x = 6$



2. An object in launched directly upward at 64 feet per second (ft/s) from a platform 80 feet high. The equation of the object's height, h, at time, t, seconds after launch is

$h(t) = -16t^2 + 64t + 80$ **. What will be the object's maximum height? When will it attain this height?**

$\frac{-b}{2a}$ = time to the top

$\frac{-64}{2(-16)} = 2$ sec.

max height $-16(2^2) + 64(2) + 80 = 144$ ft.

When a flare is fired upward at 58.8 m/s, its height, h meters, is given by the equation h = -4.9t^2 + 58.8t, where t seconds is the time since firing.

a) Determine the maximum height of the flare and the time it takes to reach this height.

$$-\frac{58.8}{2(-4.9)} = 6 \text{ seconds}$$

$$-4.9(6^2)+58.8(6) = 176.4 \text{ ft}$$

1. An object is launched from ground level directly upward at 39.2 m/s. The equation of the object's height, h, at time, t, seconds after launch is $h(t) = -4.9t^2 + 39.9t + 0$

How many seconds will it take for the object to hit the ground?

$$x = \frac{-39.9 \pm \sqrt{39.9^2 - 4(-4.9)(0)}}{2(-4.9)}$$

$$\frac{-39.9 \pm 39.9}{-9.8} = 8.14 \text{ sec}$$

$$-\frac{39.9}{2(-4.9)} = 4.07$$