1.5 **Ex 3** Projectile Height

Projectile launched vertically from ground with initial velocity of 100 ft/sec its height s (in feet) above the ground t seconds after launch

$$s = -16t^2 + 100t$$

(a) When 50 feet above ground?

$s = 50$ feet $\quad 50 = -16t^2 + 100t$

$$+16t^2 - 100t \quad +16t^2 - 100t$$

$$\frac{16t^2}{2} - \frac{100t}{2} + \frac{50}{2} = \frac{0}{2}$$

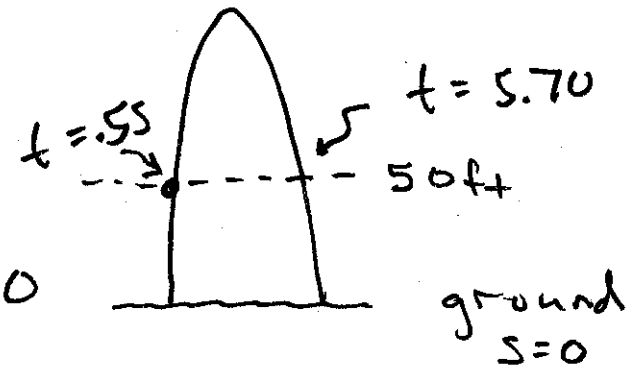
$$8t^2 - 50t + 25 = 0 \qquad a = 8,\ b = -50,\ c = 25$$

$$t = \frac{-(-50) \pm \sqrt{(-50)^2 - 4(8)(25)}}{2(8)}$$

$$t = \frac{50 \pm \sqrt{2500 - 800}}{16}$$

$$t = \frac{50 \pm \sqrt{1700}}{16}$$

$t \approx .55 \qquad t \approx 5.70$



(b) How long until projectile returns to ground?

$s = 0$

$s = -16t^2 + 100t$

$0 = -16t^2 + 100t$

$\frac{}{-4t} \quad \frac{}{-4t}$

$0 = -4t(4t - 25)$ Use Zero-factor property

$\frac{-4t}{-4} = \frac{0}{-4}$ $\quad 4t - 25 = 0$

$t = 0$ $\quad +25 \quad +25$

$\frac{4t}{4} = \frac{25}{4}$ $\rightarrow$ **$t = 6.25$ sec**

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Ex4 $y = -.00525x^2 + .0913x + 1.64$

(a) Ridership in 2011.

$x = 0$ represent 2000

$x = 11$ represent 2011

Substitute $x = 11$ $\quad y \approx 2.0$ million

(b) Year ridership 1.8 million

$1.8 = -.00525x^2 + .0913x + 1.64$

$-1.8 \qquad\qquad\qquad\qquad -1.8$

Solve with quadratic formula.