The path of a baseball is modeled by the function $f(x) = -0.002x^2 + 0.77x$ where $f(x)$ gives the height of the ball and x gives the distance from where it is hit in feet.

a. How far does the ball travel before hitting the ground?

$x \rightarrow$ distance $x = ?$
$y \rightarrow$ height $y = 0$

$f(x) = -0.002x^2 + 0.77x$

$0 = -0.002x^2 + 0.77x$

$0 = x(-0.002x + 0.77)$

$x = 0$ $\quad -0.002x + 0.77 = 0$

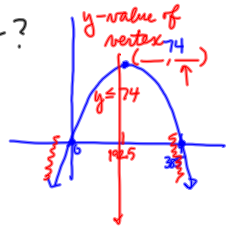
$-0.77 \quad -0.77$

$\frac{-0.002x}{-0.002} = \frac{-0.77}{-0.002}$

$x = 385$ ft

b. How high does the ball go?

$f(x) = -0.002x^2 + 0.77x$



V: $\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$

$\frac{-b}{2a} = \frac{-0.77}{2(-0.002)} = 192.5$ ft.

$f(192.5) = -0.002(192.5)^2 + 0.77(192.5)$

$= 74.1125$

approx 74 ft

c. What is a reasonable domain and range?

D: $0 \le x \le 385$

R: $0 \le y \le 74$

D: $0 \le x \le 500$

R: $0 \le y \le 100$

HW: $0 = -16t^2 + 1700$

$-1700 \quad -1700$

$\frac{-1700}{-16} = \frac{-16t^2}{-16}$

$106.25 = t^2$

$\pm\sqrt{106.25} = \sqrt{t^2}$

$\pm 10.3 = t$

$t = 10.3$

Sec. 4.7 The Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

Ex: $5x^2 - 2x = 2$

$-2 \quad -2$

$5x^2 - 2x - 2 = 0$

$a = 5 \quad b = -2 \quad c = -2$

$a \cdot c = -10$

$1 \cdot 10$

$2 \cdot 5$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{2 \pm \sqrt{4-4(5)(-2)}}{2(5)}$$

$4 + 40$

$$= \frac{2 \pm \sqrt{44}}{10} = \frac{2 \pm 2\sqrt{11}}{10}$$

$4 \cdot 11$

$$= \frac{2(1 \pm \sqrt{11})}{2 \cdot 5} = \frac{1 \pm \sqrt{11}}{5}$$

Ex: $2x^2 - 5 = -3x$

$+3x \quad +3x$

$2x^2 + 3x - 5 = 0$

$a \quad b \quad c$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{-3 \pm \sqrt{9-4(2)(-5)}}{2(2)}$$

$9 + 40$

$$= \frac{-3 \pm \sqrt{49}}{4} = \frac{-3 \pm 7}{4}$$

$\frac{-3+7}{4} = \frac{4}{4} = 1$

$\frac{-3-7}{4} = \frac{-10}{4} = -\frac{5}{2}$

$x = 1, -\frac{5}{2}$

Ex: $9x^2 + 12x - 5 = 0$