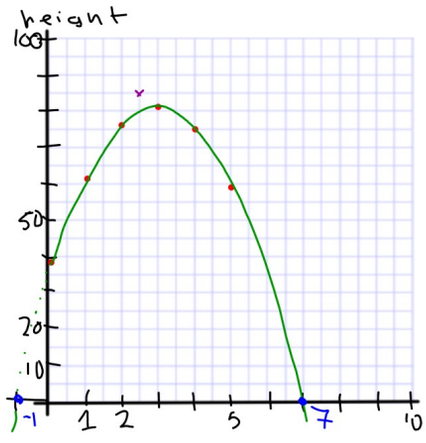
Quadratic Models Using Factored Form

Example: A bottle rocket is launched off the side of the Niagara Escarpment. The table shows the height of the rocket, in meters, compared to the time since launch, in seconds.

a) Plot the points on a grid.
b) Sketch a parabola of good fit.
c) What is the height of the escarpment?
d) At what time does the rocket hit the ground?
e) Determine an equation for the parabola.
f) Use your equation to determine the height of the rocket at 2.5 seconds.

Time	Height
0	37.7
1	61.7
2	76.0
3	80.4
4	75.0
5	59.8



pg. 175 # 1, 5, ~~6~~, 8

c) y-intercept (starting point)
-> 37.7m

d) 7 seconds (height is 0).

e) $h = a(t-7)(t+1)$
$37.7 = a(0-7)(0+1)$
$37.7 = a(-7)(1)$
$\frac{37.7}{-7} = \frac{-7a}{-7}$
$-5.4 = a$
$h = -5.4(t-7)(t+1)$

f) $h = -5.4(2.5-7)(2.5+1)$
$= -5.4(-4.5)(3.5)$
$= 85.05$