Homework: pg 153 # 1-3, 4bcd, 8, 9, 11, 12, 13

**Maximum/Minimum Values of a Quadratic Function**

The vertex (maximum/minimum) of a quadratic function can be determined using two methods:

1. Completing the square
2. Using x-intercepts

**Example 1**

Determine the maximum/minimum value of each quadratic relationship by completing the square:

1. $y=x^{2}-4x+9$ b) $y=-3x^{2}=12x-8$

**Example 2**

Determine the maximum/minimum value of each quadratic relationship by using the x-intercepts:

1. $y=x^{2}-4x+3$ b) $y=x^{2}-2x+4$

**Example 3**

A stone is thrown upwards off a bridge. The height of the stone, H(t) in meters, above the water is given by the equation:

$$H\left(t\right)=-5t^{2}+10t+40$$

* where t is the elapsed time in seconds after the stone was thrown.
1. What was the maximum height attained by the stone and how long did it take to reach this height?
2. What was the height of the bridge?