

# Pre-Calculus 11 Section 2.4 – Applications of Quadratics

Homework: Section 2.4 on Pg. 66; #1-17

It's been 2 months of nothing but quadratics so far. However, we haven't really talked about why they are useful. Today, we will go over some applications where quadratics come up and use the stuff we have learned so far to solve the problems. As it turns out, quadratics show up all over the place!

## Ex 1

A rancher is setting up a fenced rectangular area for her sheep next to a cliff (no fencing needed next to the cliff). If she has 1000m of fencing in total to use and wants to enclose the largest area:

- a) What dimensions should the rectangle be?
- b) What is the total enclosed area?

## Ex 2

A hotel is trying to decide on a nightly rate to maximize income. When they charge \$80 a night, 75% of the 400 rooms are booked. A survey of customers shows that increasing the price by \$5 would decrease the number of customers by 10. Find the nightly rate and number of customers that maximizes their income.

**Ex 3**

Mr. G goes on top of Lord Byng and throws an apple upwards over the edge of the building. The height of the rock above the ground ( $H$ , in metres) is given by:  $H(t) = -5t^2 + 12t + 11$ , where  $t$  is the time in seconds after the apple was thrown.

- a) How high is the apple above the ground when Mr. G throws it?
- b) How high does the apple go?
- c) When does the apple reach its maximum height?
- d) When does it hit the ground?