

# **7.6-Optimization**

Course Content: Maximizing profit, minimizing cost

## Example 1

A grocer sells 50 loaves of bread a day. The cost is \$0.65 a loaf. The grocer estimates that for each \$0.05 price increase, 2 fewer loaves of bread will be sold.

- a) How much should one loaf of bread cost to maximize the income?
- b) What is the maximum income he will make?

# What are we finding?

- a) The price of the loaf of bread which maximizes the profit for the grocer.
- b) The total amount of income the grocer will make at the price from part a.

# What two equations can we write?

We know information about the:

*Price of each bread loaf*

*Number of loafs sold*

# The two equations

- Let  $x$  be the number of \$0.05 increases.

How much is a single loaf of bread after  $x$  increases?

$$0.65 + 0.05x = \textit{Price of Bread}$$

How many loafs of bread will be sold after  $x$  increases?

$$50 - 2x = \textit{Number of loafs sold}$$

# Writing a equation for Income

- $\text{Income} = \text{price} \times \text{number sold}$

Take the derivative and set to 0

# Back to the questions

- a) How much should one loaf of bread cost to maximize the income?
- b) What is the maximum income he will make?

