

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

- $Income = price \times number\ sold$

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?

