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?

$$0.65 + 0.05x = Price\ of\ Bread$$

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

$$50 - 2x = Number\ of\ loafs\ sold$$

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?