In this example, I am supposing that I was asked to write up a report which solves (with explanation) the following problem:

The price-demand equation and the cost function for the production of table saws are given, respectively, by

\[ x = 6000 - 30p \quad \text{and} \quad C(x) = 72,000 + 60x, \]

where \( x \) is the number of saws that can be sold at a price of \( p \) per saw and \( C(x) \) is the total cost (in dollars) of producing \( x \) saws.

(A) Find the revenue and profit functions, \( R(x) \) and \( P(x) \).

(B) Find the marginal revenue and marginal profit functions.

(C) Find \( R'(1500) \) and \( P'(1500) \) and interpret these quantities.

I would first do the math. Then I would type up the report as shown on pages 2 through 4 of this document. In your write-up, answer all questions with explanation. Imagine that I am your boss, and I’m not super smart, and if there’s something I don’t understand in the report, you’ll pay for it. Your report should be similar to a series of well-explained examples in a textbook. Also, keep in mind the items mentioned on the grading rubric that’s posted below the assignment itself.

The last paragraph of the assignment is a bit vague, in my opinion. What I want to see is that after all the questions are answered with clear explanation, give a summary of only your results at the end, as I did on the next page. Don’t forget to say what you think is the importance of marginal analysis in business operations. This should tie in with some of the results you’ve just summarized.

There is no specific format that I’m looking for, but your write-up should be neat and consistent. This is due by 5 pm on MONDAY, April 13.

10% per day penalty for lateness.
Math 202-07 Written Project

Eric Remaley

April 13, 2015
Part A: Finding Revenue and Cost Functions

In part A, we're asked to find the revenue and profit functions. We know that

Since we want \( R(x) \) (meaning revenue as a function of \( x \)), we need to replace \( p \) in the above equation by some \( x \) stuff. We can do this by solving the price-demand for \( p \):

Original equation:

\[
x = 6000 - 30p
\]

Add 30\( p \) to both sides:

\[
x + 30p = 6000 - 70p + 30p \quad \Rightarrow \quad x + 30p = 6000
\]

Subtract \( x \) from both sides:

\[
x + 30p - x = 6000 - x \quad \Rightarrow \quad 30p = 6000 - x
\]

Divide both sides by 30:

\[
\frac{30p}{30} = \frac{6000 - x}{30} \quad \Rightarrow \quad p = 200 - \frac{x}{30}.
\]

Now, substituting \( 200 - x/30 \) for \( p \) in the revenue equation, we get

\[
R = xp = x (200 - x/30) = 200x - \frac{x^2}{30}.
\]

Next, using the formula

\[
\text{Profit} = P = R - C,
\]

we have

\[
P = (200x - \frac{x^2}{30}) - (72000 + 60x) = -\frac{x^2}{30} + 140x - 72000.
\]

Part B: Finding Marginal Revenue and Marginal Cost Functions

Blaa blaa blaa blaa blaa ....

Part C: Finding and Interpreting \( R'(1500) \) and \( P'(1500) \).

Blaa blaa blaa blaa blaa ....
Summary and Discussion

In this report, I found that:

Revenue as a function of demand is \( R(x) = 700x - \frac{1}{10}x^2 \)

Profit as a function of demand is \( P(x) = -\frac{1}{30}x^2 + 140x - 72000 \)

Etc.

Marginal analysis is important in business operations because ....