Preface

Here are a set of practice problems for my Calculus I notes. If you are viewing the pdf version of this document (as opposed to viewing it on the web) this document contains only the problems themselves and no solutions are included in this document. Solutions can be found in a number of places on the site.

1. If you'd like a pdf document containing the solutions go to the note page for the section you'd like solutions for and select the download solutions link from there. Or,

2. Go to the download page for the site http://tutorial.math.lamar.edu/download.aspx and select the section you'd like solutions for and a link will be provided there.

3. If you'd like to view the solutions on the web or solutions to an individual problem you can go to the problem set web page, select the problem you want the solution for. At this point I do not provide pdf versions of individual solutions, but for a particular problem you can select "Printable View" from the "Solution Pane Options" to get a printable version.

Note that some sections will have more problems than others and some will have more or less of a variety of problems. Most sections should have a range of difficulty levels in the problems although this will vary from section to section.

I add problems to this document as I get a chance and so that means that sometimes some sections are apparently given more attention than others. Eventually I'll have a full complement of problems for all the sections, however it takes time to write the problems, write the solutions for each problem and format them for presentation on the web. If there aren't practice problems for a given section (or there aren't that many problems in a section) then know that I will eventually get around to writing problems for the section (or more problems for the section as the case may be).

Please do not email me asking when I'm going to get problems for a particular section written. As I've already said, I write problems as I have time to do so. Please understand that I have my own classes to teach and other responsibilities to my department that I have to also take care of. This web site and all of its information has been written and maintained in my spare time and that often means that I don't have as much time to work on it as I'd like to.

Optimization

1. Find two positive numbers whose sum is 300 and whose product is a maximum.

2. Find two positive numbers whose product is 750 and for which the sum of one and 10 times the other is a minimum.

3. Let x and y be two positive numbers such that $x + 2y = 50$ and $(x+1)(y+2)$ is a maximum.

4. We are going to fence in a rectangular field. If we look at the field from above the cost of the vertical sides are $10/ft, the cost of the bottom is $2/ft and the cost of the top is $7/ft. If we have $700 determine the dimensions of the field that will maximize the enclosed area.

5. We have 45 m^2 of material to build a box with a square base and no top. Determine the dimensions of the box that will maximize the enclosed volume.

6. We want to build a box whose base length is 6 times the base width and the box will enclose 20 in^3. The cost of the material of the sides is $3/in^2 and the cost of the top and bottom is $15/in^2. Determine the dimensions of the box that will minimize the cost.

7. We want to construct a cylindrical can with a bottom but no top that will have a volume of 30 cm^3. Determine the dimensions of the can that will minimize the amount of material needed to construct the can.

8. We have a piece of cardboard that is 50 cm by 20 cm and we are going to cut out the corners and fold up the sides to form a box. Determine the height of the box that will give a maximum volume.