CALCULUS, Math 17C
Homework 1 Due April 13

1. Read sections 10.1-10.3
2. Solve exercises 10.1: #2*,3,4,5,6,13,15,17,19-22,23,24
3. Solve Problems from 10.2: #7,17, 21
4. Solve Problems from 10.3: #1,9,17,19,21
5. Do additional problems listed below.
6. Addition problem for 10.1 #2, (a) Plot the corresponding level sets (contours) of the function for MAP=1, 2, and 3.

   (b) Suppose $DP = 1$ and S$P = 4$. What is the MAP value? Is there a way to smoothly change DP and SP and keep MAP constant? Explain your answer.
7. The body mass index for a person (BMI) is given by the equation

$$f(m,h) = \frac{m}{h^2}$$

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   Where m is the person's mass (in kilograms) and h is the person's height (in meters), i.e., f is a function of two variables. A rough guide is that a person is underweight if the BMI is less than 18.5; optimal if the BMI lies between 18.5 and 25; overweight if the BMI between 25 and 30; and obese if the BMI exceeds 30.

   a) if someone weight 60Kg and is 168cm tall, what is their BMI?

   b) Sketch some level curves (contours) of $f(m,h)$ for BMI= 10, 18.5, 25, 30, 38.5. Then shade the region that corresponds to the optimal BMI. Does Someone who weighs 62 kg and is 152 cm tall fall into this category?

   c) Draw the level curve (contour) of the BMI function corresponding to someone who is 200 cm tall and weighs 80 kg. Find weights and heights of two other people with this same level curve (i.e. with the same BMI).

   d) Attempt to draw the surface plot corresponding to this function.
8. Consider the function from problem 10.2 17.

$$z = f(x,y) = \frac{4xy}{x^2+y^2}$$

   a) Draw some level curves (contour plots) for $f(x,y)$. What is bizarre about this function at $(x,y) = (0,0)$?

   b) Attempt to draw the surface plot corresponding to this function.