Math 16C
Vogler
Worksheet 5

On each of the following problems you need only determine the desired critical point and its corresponding extreme value. Do not apply the second derivative test.

1.) Construct a closed rectangular box having a volume of 8 cubic feet. What are the dimensions of the box having a minimum surface area ? What is the minimum surface area ?

2.) Construct an open (no top) rectangular box from material which costs 3/4 cents per square foot for the bottom and 3 cents per square foot for the sides. What are the dimensions of the least expensive box having a volume of 1 cubic foot ? What is the minimum cost ?

3.) Determine the shortest distance from the origin to the plane $x + 2y + 3z = 6$.

4.) Determine the shortest distance between the graphs of $y = e^x$ and $y = x$. (This problem is somewhat challenging. It can be solved a couple of different ways.)