Optimization Problems

1. Find the length and width of a rectangle that has the given perimeter and a maximum area
(similar to p.201 #1)

Perimeter: 16 meters

2. Find the length and width of a rectangle that has the given area and a minimum perimeter
(similar to p.201 #3)

Area: 81 square feet

3. A rectangular pasture borders a river. If we wish to put cattle in this area and don't need a fence along the river and we want the area to be 100,000 square meters, what dimensions will minimize the amount of fencing?
(similar to p.201 #6)

4. A Norman window has a semi-circle on top of a rectangular window. Find the dimensions of a Norman window of maximum area if the total perimeter is 20 feet.
(similar to p.202 #12)