Problem Set #5

ECON 407: Mathematical Economics

(**due next class**)

1. For the following functions, (i) find the critical values and (ii) test to see if the critical values are a relative maximum, minimum, or neither.

a)

b)

c)

2. Find the optimal level of output, , that maximizes profit, , for a firm given total revenue and total cost , assuming . What is the profit level at ?

3. A producer has the possibility of discriminating between the domestic and foreign markets for a product. That is, the producer can charge one price in the domestic market and a different price in the foreign market. The demand functions for the domestic and foreign markets, respectively, are

Total production costs across both markets are where .

What price will the producer charge in order to maximize profits with discrimination between markets? What quantity will be sold in each market at this price? **Hint**: set marginal revenue (MR) equal to marginal cost (MC) in each market.