

## Math 220 - Calculus f. Business and Management - Worksheet 28

### Worksheet 28 - Optimization of Business Functions

#### Exercise 1:

A manufacturer can make a profit of  $P(z)$  (in hundreds of dollars) from the sale of  $z$  thousand items according to the formula:  $P(z) = -z^3 + 9z$ . Find the number of items that should be sold to maximize profit. Find out what profit will be made at that point. You may use your calculator to find an approximate answer.

#### Exercise 2:

The cost to manufacture  $x$  units of a product is  $15000 + 40x + 0.02x^2$ . The revenue from the sale of these products is  $100x - .01x^2$ . Find the number of products that will maximize profit.

#### Exercise 3:

A manufacturer makes a product that costs \$12 to produce. He estimates that the demand will be  $50 - x$  units when the price is  $x$  dollars. Find the cost, revenue and profit equations (as functions of price). Then find the price that maximizes the profit.

#### Exercise 4:

The cost to build  $q$  items is  $6000 + 5q + 0.01q^2$ . In order to sell  $q$  items, the price will need to be  $p(q) = 20 - q/4$ . Find the quantity that will maximize profits.