

### 3.7 - MARGINAL ANALYSIS - analyzing cost, revenue and profit function derivatives

#### **I. Marginal Cost, Revenue, and Profit**

Recall:            Total Cost = (variable costs) (quantity produced) + (fixed costs)  
                      Total Revenue = (price per unit) (quantity sold)  
                      Total Profit = Total Revenue - Total Cost

Marginal Cost = rate of change of total cost = derivative of total cost

Marginal Revenue = rate of change of total revenue = derivative of total revenue

Marginal Profit = rate of change of total profit = derivative of total profit

The price equation for the production of television sets is given by  $x = 9,000 - 30p$  and the cost equation is  $C(x) = 150,000 + 30x$ , where  $x$  is the number of sets that can be sold at a price  $\$p$  per set and  $C(x)$  is the total cost (in dollars) of producing  $x$  sets.

(a) Find the Revenue and Profit functions.

(b) Find the marginal cost, revenue and profit functions.

(c) Evaluate marginal cost, revenue and profit at  $x = 2000$  and interpret.

(e) Sketch Cost and Revenue together and interpret.

## **II. Marginal Average Cost, Revenue, and Profit**

Definitions:

Cost Analysis:

3.7 HW # 1 - 29 (every other odd), 35, 37, 39, 43