Calculus I Name

Economic and Business Applications Block Date

Cost -

 Total cost Average Cost Marginal Cost

Minimal cost:

Revenue –

*
*

Marginal revenue ­-

 Maximize revenue:

Profit -

*
*

Marginal profit ­-

Maximize profit:

1. A company estimates that it can sell 1000 units per week if it sets the price at $3, but that its weekly sales will increase by 100 units for each $.10 decrease in price. If *x* is the number of units sold each week () find the following.

 **Price Function**

Find the number of units and the corresponding price that will maximize weekly revenue.

1. The production costs per week for producing *x* widgets is given by . Answer the following questions.

What is the total cost to produce the 301st widget?

What is the rate of change of the cost at x = 300?

1. A firm determines that *x* units of its product can be sold daily at *p* dollars per unit, where . The cost of producing *x* units per days is .

Find the revenue function.

Find the profit function.

Find the cost, revenue and profit at the following 10 units, 100 units, 250 units, 500 units.

Find the average cost of producing 100 items. Find the cost of producing the 100th unit.

Explain each in content of the problem.

Find the average revenue of producing 100 items. Find the marginal revenue equation. Then find the marginal revenue made on the 100item.

Find the average profit of producing 100 items. Find the marginal profit equation. Then find the marginal profit made on the 100item.

Assuming that the production capacity is at most 500 units per day, determine how many units the company must produce and sell each day to maximize the profit. Find the maximum profit.

What price per unit must be charged to obtain the maximum profit?

1. In manufacturing and selling *x* units of a certain commodity, the price function *p* and the cost function *C* (in dollars) are given by and .

Determine the revenue and profit functions.

Find the expression for the marginal cost, marginal revenue, and marginal profit.

Find the cost, revenue, profit, average cost, marginal cost, average revenue, marginal revenue, average profit and marginal profit at 20 units, 800 units, and 1200 units. Interpret the difference between average and marginal for each item.

Determine the production level that will produce the maximum total profit. Then determine

the maximum profit.

1. An apartment complex has 250 apartments to rent. If they rent *x* apartments then their monthly profit, in dollars, is given by .

How many apartments should they rent to maximize their profit?

1. The weekly cost to produce *x* widgets is given by , , and the demand function for the widgets is given by, , . Determine the marginal cost, marginal revenue, and marginal profit when 2500 widgets are sold and when 7500 widgets are sold. Assume that the company sells exactly what they produce.
2. A commercial cattle ranch currently allows 20 steers per acre of grazing land; on the average its steers weigh 2000 lb. at market. Estimates by the Agriculture Department indicate that the average market weight per steer will be reduced by 50lbs for each additional steer added per acre of grazing land. How many steers per acre should be allowed to get the largest possible total market weight for its cattle? Use the min/max existence theorem to verify your answer is the maximum.