MTH 2201 - Test #3

Spring 2016

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1. Management at a clothing manufacturer determines that in order for the production of a particular suit to be viable, the price per suit must be given by the function: $p(x) = 150 - 0.5x$, where x is the number of suits ordered by their retail outlets.

   Furthermore, the total cost of producing x suits is given by the function: $C(x) = 4000 + 0.25x^2$.

   (a) Find the *total revenue,* $R(x)$

   (b) Find the *total profit,* $P(x)$

   (c) How many suits must the manufacturer produce and distribute to their retail stores in order maximize the profit?

2. A manufacturer finds that in producing q units per day, (for $0 < q < 15,000$) three different kinds of cost are involved.

   - A fixed cost of \$2000 per day
   - A production cost of \$6.25 per day for each unit produced
   - An ordering cost of $\$2000q^{-1}$ per day (i.e. $\$\frac{2000}{q}$ per day).

   (a) Express the total cost as a function of q

   (b) Determine the level of production that minimizes the total cost.

3. Management at a computer manufacturer finds that *daily profit* (in dollars) from the production and sale of its laptop computer is given by the function: $P(x) = -0.004x^3 - 0.3x^2 + 600x - 800$.

   Currently, the manufacturer produces 9 laptops daily.

   (a) What is the current daily profit?

   (b) What is the marginal profit at the current level of production?

   (c) Estimate the approximate *increase in profit* associated with an increase in production of one unit per day, from 9 units to 10 units.