

MCV 4UI – More Business & Economics Optimization

- A company determines that the cost of producing x items is $C(x) = 280\,000 + 12.5x + 0.07x^2$.
 - Find the average cost and marginal cost of producing 1000 items.
 - At what production level will the average cost be minimized?
 - What is the minimum average cost?
- The Bouchard Soup Company estimates that the cost of making x cans of soup is $C(x) = 48\,000 + 0.28x + 0.000\,01x^2$, and the revenue is $R(x) = 0.68x - 0.000\,01x^2$. How many cans of soup should be sold to maximize profits?
- Sue's Submarines has found that the monthly demand for subs is given by $p(x) = \frac{30\,000 - x}{10\,000}$, while the cost of making x subs is $C(x) = 6000 + 0.8x$. What level of sales will maximize profit?
- A baseball team plays in a stadium that holds 52 000 spectators. Average attendance at a game was 27 000 with tickets priced at \$30. When ticket prices were lowered to \$25, the average attendance rose to 33 000.
 - Find the demand function, assuming it is linear.
 - At what price should the owners set the tickets in order to maximize revenue?
- A manager of a 120-unit apartment complex knows from experience that all units will be occupied if the rent is \$400 per month. A market survey suggests that, on average, one additional unit will remain vacant for every \$10 increase in rent. What rent should she charge to maximize revenue?

ANSWERS

- 1 a) $c(1000) = \$362.50/\text{item}$, $C'(1000) = \$152.50/\text{item}$ b) 2000 items c) \$292.50/item
2. 10 000 cans of soup
3. 11 000 subs
- 4 a) $p(x) = -\frac{1}{1200}x + 52.5$ b) \$26.25
5. \$800/unit

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