

Ch. 19 - BOARD PROBLEMS

① $x(t) = 64t - 11et^2$ $x = \text{distance}$

when will the velocity EQUAL TO ZERO?

② THE DISTANCE A MISSILE TRAVELS IS
 $s(t) = \frac{3}{5}t^5 - 100.$

what is the acceleration formula?

③ WHAT IS THE VELOCITY OF MISSILE AFTER 10s?
20s? 1 hour?

④ FIND THE DERIVATIVE.
 $y = 5x^2 \cdot \sec^2(4x)$

Ch. 19 - ECONOMIC APPLICATIONS

IN BUSINESS WE MAXIMIZE PROFITS
AND MINIMIZE COSTS.

ECONOMIC TERMS

$C(x) =$ _____

$c(x) =$ _____

$p(x) =$ _____

$R(x) =$ _____

$P(x) =$ _____

BREAK - EVEN POINT _____

EX. 1

GIVEN THE COST FUNCTION

$$C(x) = 500 + 20x - .1x^2 + .001x^3$$

a. FIND THE AVERAGE COST FUNCTION.

b. FIND THE MARGINAL COST FUNCTION.

c. FIND THE MINIMUM VALUE OF THE MARGINAL COST.

EX. 2

Funtime Computer Company has produced a new computer program with an estimated price of $p(x) = 50 - .001x$, where x is the number of sales per year and $p(x)$ is the price in dollars. The cost of manufacturing is 10 dollars per program plus fixed costs of \$100,000.

a. Where is the price = 0? Draw a sketch

b. Find the revenue function. Draw a sketch

c. Maximize the revenue function.

d. Determine the cost function.

e. What is the cost of the 10,001st item?

EX. 2

continued ...

f. What is the cost to produce an additional item?

g. Determine the profit function.

h. Find the maximum profit.

Ex. 3

NeverFall Printer Corporation has just produced their best printer ever. The cost to produce one printer is \$100.00. The startup costs are \$90,000 and each printer will sell for \$250.00. Where will the break-even point occur?

Answer the question.

1. NeverDull Company has a new shampoo. The cost to the consumer is \$7.60 for a medium-sized bottle. If the starting costs are \$18,000.00 and each bottle costs \$5.20 to produce, how many bottles of shampoo would NeverDull have to sell in order to break even? Include a sketch of the graph showing the revenue and cost functions, break-even point, and the area where the company would experience a profit or a loss.

2. A new sweater style was produced at a cost in dollars of $C(x) = \frac{1}{8}x^2 + 4x + 200$. All sweaters can be sold at a price of $p(x) = 49 - x$ dollars per sweater. Maximize the profit.

LESSON PRACTICE 19A

3. Costs for ABC Outerwear Company's new line of winter coats is given by $C(x) = 75,000 + 100x - .03x^2 + .000004x^3$. The price function is $p(x) = 200 - .005x$.

a. Determine the revenue function.

b. Find the profit function.

c. Find the marginal cost function.

d. Find the marginal revenue function.

e. Find the marginal profit function.

f. When selling the 2501st item, approximately what will it cost to manufacture, what will be the added revenue, and what would be the profit for that item?