Name: _____ Date: _____

BLM 5–5

Chapter 5 Case Study

Tools

- graphing calculator

Financial Planning Manager

- While working part-time at a hardware store, Ismail Khan acquired an interest in business management.
- Upon graduating from secondary school, Ismail completed a financial planning management program at a college in Toronto.
- He set up a financial service business for small companies.
- He helps improve revenue for his clients by collecting data concerning inventory costs, sales, and pricing. He gathers further information by conducting surveys with his clients' customers.
- One of his clients, Sarah, manufactures and sells her own brand of shoes. She is interested in pricing these shoes to maximize her profit.

Questions

1. Sarah makes specialty shoes by hand. The price she charges depends on the number of shoes, x, she makes each month. The demand function, or price function, $P(x)$, represents the price Sarah can charge for the shoes, depending on the number of pairs she has available. Based on Sarah's sales records for the past four months, Ismail made the table of values shown. Determine an equation for the price function.

x	$P(x)$
30	\$90
35	\$80
40	\$70
45	\$60

2. The revenue function, $R(x)$, represents the total money generated by selling x pairs of shoes. By definition, $R(x) = xP(x)$. Write a simplified equation for $R(x)$.

3. The cost function, $C(x)$, represents the total cost of making x pairs of shoes. Sarah provided Ismail with a complete list of operating costs for the past four months. Using this information, he developed an equation to model the cost function.

a) Use finite differences to determine the degree of the cost function.

b) Use the appropriate regression on a graphing calculator to find a model for the cost function.

x	$C(x)$
30	\$2020
35	\$2365
40	\$2760
45	\$3205

4. The profit function, $P(x)$, is equal to the difference between the revenue, $R(x)$, and the cost, $C(x)$.

a) Determine a simplified equation for the profit function.

b) Determine the number of pairs of shoes per month that Sarah should sell in order to maximize her profit.

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