

Section 2.5 Applications of Derivatives (Minimum homework: 1 – 9 odds)

1) The cost function for producing x units of a certain product is: $C(x) = 0.1x^2 + 8x + 100$,

- a) Find $C(100)$
- b) Interpret your answer to part a.
- c) Create the marginal cost function $C'(x)$ for this product.
- d) Find $C'(100)$
- e) Interpret your answer to question part d.

2) The cost function for producing x units of a certain product is: $C(x) = 0.4x^2 + 7x + 8$,

- a) Find $C(4)$
- b) Interpret your answer to part a.
- c) Create the marginal cost function $C'(x)$ for this product.
- d) Find $C'(4)$
- e) Interpret your answer to question part d.

3) Suppose that the cost in dollars to make x cell phone cases is given by: $C(x) = \ln(x) + 2x$

- a) Find $C(100)$ (round to 2 decimals)
- b) Interpret your answer to part a.
- c) Create the marginal cost function $C'(x)$ for this product.
- d) Find $C'(100)$ (round to 2 decimals)
- e) Interpret your answer to question part d.

4) Suppose that the cost in dollars to make a x pairs of socks is given by: $C(x) = \ln(x) + 0.75x$

- a) Find $C(50)$ (round to 2 decimals)
- b) Interpret your answer to part a.
- c) Create the marginal cost function $C'(x)$ for this product.
- d) Find $C'(50)$ (round to 2 decimals)
- e) Interpret your answer to question part d.

5) Bob's Bobble heads company determines the profit function for producing and selling a certain bobble head can be modeled by: $P(x) = -0.001x^2 + 8x - 1000$ $0 \leq x \leq 7000$. Where x represents the number of bobble heads sold and $P(x)$ represents the monthly profit in dollars.

- Find $P(1,000)$
- Interpret your answer to part a. (round your answer to 2 decimals)
- Create the marginal profit function $P'(x)$ for this product.
- Find $P'(1,000)$.
- Interpret your answer to part d.

6) The Radio Corporation determines the weekly profit ($P(x)$) from selling x radios can be modeled by: $P(x) = -0.01x^2 + 12x - 2000$ $0 \leq x \leq 1000$.

- Find $P(500)$
- Interpret your answer to part a. (round your answer to 2 decimals)
- Create the marginal profit function $P'(x)$ for this product.
- Find $P'(500)$.
- Interpret your answer to part d.

7) A self-employed person determines that the weekly profit from his current vending machine route can be modeled by: $P(x) = 10x - \sqrt{x}$ $0 \leq x \leq 200$; where x represents the number of vending machines stocked and $P(x)$ represents the weekly profit.

- Find $P(64)$
- Interpret your answer to part a. (round your answer to 2 decimals)
- Create the marginal profit function $P'(x)$ for this product.
- Find $P'(64)$. (round to 2 decimals)
- Interpret your answer to part d.

8) A telemarketing company has determined that the daily profit ($P(x)$) from selling x subscriptions can be modeled by: $P(x) = 15x + \sqrt{x}$ $0 \leq x \leq 100$

- Find $P(16)$
- Interpret your answer to part a. (round your answer to 2 decimals)
- Create the marginal profit function $P'(x)$ for this product.
- Find $P'(16)$. (round to 2 decimals)
- Interpret your answer to part d.

9) A Sun City couple has a small garden, and they grow blueberries. They have found the price-demand function is: $p(x) = -0.50x + 6.50$

Where x is the number of quarts of blueberries demanded and $p(x)$ represents the price per quart in dollars.

- a) Find $p(5)$ round to 1 decimal.
- b) Interpret your answer to part a.
- c) Create a revenue function $R(x)$ hint $R(x) = x * p(x)$ (revenue = quantity*price)
- d) Find $R(5)$.
- e) Interpret your answer to part d.
- f) Find the marginal revenue function $R'(x)$.
- g) Find $R'(5)$.
- h) Interpret your answer to part g.

10) A Boy Scout troop builds pinewood derby cars. They have found the price-demand function is: $p(x) = -0.50x + 25$

Where x is the number of pinewood derby cars demanded and $p(x)$ represents the price of a car in dollars.

- a) Find $p(10)$ round to 1 decimal.
- b) Interpret your answer to part a.
- c) Create a revenue function $R(x)$ hint $R(x) = x * p(x)$ (revenue = quantity*price)
- d) Find $R(10)$.
- e) Interpret your answer to part d.
- f) Find the marginal revenue function $R'(x)$.
- g) Find $R'(10)$.
- h) Interpret your answer to part g.