Dawson College: Calculus I: 201-NYA-05 S17 October 28, 2011

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 7

Question 1. *(10 marks)* The weekly demand for the Pilsar 25 colour LED television is

$$p = 600 - 0.05x \quad (0 \le x \le 12\,000)$$

were p denotes the wholesale unit price in dollars and x denotes the quantity demanded. The weekly total cost function associated with manufacturing the Pilsar 25 is given by

$$C(x) = 0.000002x^3 - 0.03x^2 + 400x + 80\,000$$

where $C(x)$ denotes the total cost incurred in producing x sets.
(a) Find the revenue function $R(x)$ and the profit function $P(x)$
(b) Mind the marginal cost, marginal revenue and marginal profit function.
(c) Evaluate $C'(2000)$ and $P'(2000)$. What do these values tell us?

a) $R(x) = xp = x(600 - 0.05x) = 600x - 0.05x^2$

$P(x) = R(x) - C(x) = (600x - 0.05x^2) - (0.000002x^3 - 0.03x^2 + 400x + 80\,000)$

$= -0.000002x^3 - 0.02x^2 + 200x - 80\,000$

b) $C'(x) = 0.000006x^2 - 0.06x + 400$

$R'(x) = 600 - 0.1x$

$P'(x) = -0.000006x^2 - 0.04x + 200$

c) $C'(2000) = 0.000006(2000)^2 - 0.06(2000)^1 + 400$

$= \$304$

∴ THE COST OF PRODUCING THE 2001ST UNIT IS APPROXIMATELY $304

$P'(2000) = -0.000006(2000)^2 - 0.04(2000) + 200$

$= \$96$

∴ THE PROFIT REALIZED FROM THE SALE OF THE 2001ST UNIT IS APPROXIMATELY $96.