Quiz 6

Question 1. *(10 marks)* The weekly demand for the pulsar 25 colour LED television is
$p = 600 - 0.05x$ where p denotes the wholesale unit price in dollars and x denotes the quantity
demanded. The weelky total cost function associated with manufacturing the Pulsar 25 is given by
$C(x) = 0.000002x^3 - 0.03x^2 + 400x + 80\,000$ where $C(x)$ denotes the total cost incurred in produc-
ing x sets.
(a) Find the Revenue function and the profit function.
(b) Find the marginal cost function, marginal revenue function and marginal profit function.
(c) Evalutae the functions from part **(b)** at $x = 2000$ and interpret your results.

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) MARGINAL COST: $C'(x) = 0.000006x^2 - 0.06x + 400$

MARGINAL REVENUE: $R'(x) = 600 - 0.1x$

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

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

$= 304$

$R'(2000) = 600 - 0.1(2000) = 400$

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

$= 96$

∴ THE COST OF PRODUCING THE 2001st T.V. IS APPROXIMATELY $304

THE REVENUE REALIZED FROM THE SALE OF THE 2001st T.V. IS
APPROXIMATELY $304

THE PROFIT REALIZED FROM THE SALE OF THE 2001st T.V.
IS APPROXIMATELY $96