CONCORDIA UNIVERSITY
Department of Mathematics & Statistics

Course	Number		Section(s)
Mathematics	208/1		All except EC
Examination	**Date**	**Time**	**Pages**
Final	June 2013	3 Hours	3
Instructors			**Course Examiner**
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FORMULAE:
$A = P(1+i)^n, \quad A = Pe^{rt}, \quad FV = PMT\dfrac{(1+i)^n - 1}{i}, \quad PV = PMT\dfrac{1-(1+i)^{-n}}{i}$

Special Instructions:

- ▷ Answer all questions.
- ▷ **Only approved calculators are allowed.**

MARKS

[10] **1.** The marketing research department for a company that manufactures and sells notebook computers established the following price-demand, revenue and cost functions:

$$p(x) = 2,000 - 60x$$
$$R(x) = x(2,000 - 60x)$$
$$C(x) = 4,000 + 500x$$

where $p(x)$ is the wholesale price in dollars at which x thousand computers can be sold, and $R(x)$, and $C(x)$ are in thousands of dollars. Both functions have domain $1 \leq x \leq 25$.

(A) Find the output that will produce the maximum revenue. What is the maximum revenue to the nearest thousand dollars?

(B) What is the wholesale price per computer (to the nearest dollar) that produces the maximum revenue?

(C) Find the break-even points algebraically to the nearest thousand computers.

[10] **2.** Solve for x in the following equations:

(A) $(6)^{x^2+8} = (216)^{2x}$

(B) $e^{-x^2} = (e^x)^2\left(\dfrac{1}{e^3}\right)$

(C) $\log_2(8)^x = -3$

(D) $\log_a x + \log_a(x-4) = \log_a(x+6)$

(E) $\log_{\frac{1}{3}}(x^2+x) - \log_{\frac{1}{3}}(x^2-x) = -1$