CONCORDIA UNIVERSITY
Department of Mathematics & Statistics

Course	Number		Section(s)
Mathematics	208/2		All
Examination	**Date**	**Time**	**Pages**
Midterm	October 2014	1 Hour 30 minutes	2

Instructors	Course Examiner
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FORMULAE:

$$A = P(1+i)^n, \quad A = Pe^{rt}, \quad FV = PMT\,\frac{(1+i)^n - 1}{i}, \quad PV = PMT\,\frac{1-(1+i)^{-n}}{i}$$

Special Instructions:

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

MARKS

[4+3+3] **1.** Given the quadratic function $f(x) = 0.5x^2 - 2x + 5$

(A) Find x and y intercepts algebraically.

(B) Find the vertex form for f.

(C) Find the vertex and the maximum or minimum value.

[$2\frac{1}{2} * 4$] **2.** Solve for x in the following equations:

(A) $5^{7x-x^2} = 125^{-6}$

(B) $\ln x + \ln(x+1) = \ln 6$

(C) $e^{x^2-5x} = 1$

(D) $\log_4(x^2 - 9) = 2$

PLEASE TURN OVER

[5+5] **3.**

(A) If the 11th and 19th terms of an arithmetic sequence are 20 and -28 respectively, find the sum of the first 76 terms of the sequence.

(B) Given the geometric sequence $100, 50, 25, \ldots\ldots\ldots\ldots$, find the $10th$ term and the sum of the entire infinite sequence.

[3+3+4] **4.** If I borrow \$500 from a loanshark at 1% per week,

(A) What is the Annual Percentage Yield (APY) for this weekly compound interest scheme? (1 year=52 weeks)

(B) How much do I owe after 6 months?

(C) How many weeks does it take for my debt to double?

[10] **5.** Beginning in January, a person plans to deposit \$100 at the end of each month into an account earning 6% compounded monthly. Each year taxes must be paid on the interest earned during that year. Find the interest earned during each year for the first 3 years.

[5+5] **6.** A student receives a federal backed student loan of \$6,000 at 3.5% interest compounded monthly. After finishing college in 2 years, the student must amortize the loan in the next 4 years by making equal monthly payments.

(A) What will the payments be?

(B) What total interest will the student pay?