

CONCORDIA UNIVERSITY
Department of Mathematics & Statistics

Course	Number	Section(s)
Mathematics	208/2	All

Examination	Date	Time	Pages
Midterm	October 2011	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.**
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MARKS

- [10] 1. At a price of \$2.28 per bushel, the supply of barley is 7,500 million bushels and the demand is 7,900 million bushels. At a price of \$2.37 per bushel, the supply of barley is 7,900 million bushels and the demand is 7,800 million bushels.

- (A) Find a price-supply equation of the form $p = mx + b$.
- (B) Find a price-demand equation of the form $p = mx + b$.
- (C) Find the equilibrium point.

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

- (A) $64^{x^2} = 256^x$
- (B) $3^{\log_2 x} = 3^5$
- (C) $(e)^{-x^2-1} = (e)^{3x+1}$
- (D) $\log_{10}(x + 1) - \log_{10}(10x - 3) = 1$

PLEASE TURN OVER

[10] 3.

- (A) If the 1st and 15th terms of an arithmetic sequence are -5 and 23 , respectively, find the 73rd term of the sequence.
- (B) If the 1st and 10th terms of a geometric sequence are 3 and 30 , respectively, find the 40th term (to three decimal places) of the sequence.

[10] 4. For services rendered, an attorney accepts a 90 day note for $\$5,500$ at 8% simple interest from a client (both interest and principal are repaid at the end of 90 days). Wishing to use her money sooner, the attorney sells the note to a third party for $\$5,560$ after 30 days. What annual interest rate will the third party receive for the investment?

[10] 5. If $\$500$ is deposited each quarter into an account paying 8% compounded quarterly for 3 years, find the interest earned during each of the 3 years.

[10] 6. A family has a $\$240,000$, 20-year mortgage at 5.75% compounded monthly.

- (A) Find the monthly payment and the total interest paid.
- (B) Find the unpaid balance after 8 years.