

SULTAN QABOOS UNIVERSITY
DEPARTMENT OF MATHEMATICS AND STATISTICS
May 2 2008

BUSINESS MATHEMATICS I (MATH1101)

Spring 2009, Second Exam

(Time allowed: 60 minutes)

NAME: _____ **ID#:** _____ **Section:** _____

INSTRUCTIONS: Please read these instructions before you start solving.

- Write your name, ID number and Section number in the first page and ID number at the top of each sheet.
- You need to show your complete, mathematically correct and neatly written work.
- It is prohibited to exchange calculators or share any material during the exam.
- You may use the back side of the page if needed.
- Please keep the sheets stapled.

Question	points	score
Q1	4 pts	
Q2	6 pts	
Q3	7 pts	
Q4	9 pts	
Q5	8 pts	
Q6	6 pts	
TOTAL	40 pts	

Solve each of the following questions. You need to show your complete, mathematically correct and neatly written work.

Q1: **i:** Determine the values of u , v , and w so that (3 points)

$$\begin{bmatrix} 4 & u & 3 \\ v & -1 & 2 \end{bmatrix} = \begin{bmatrix} v-1 & 2-u & 3 \\ 5 & w+1 & 2 \end{bmatrix}.$$

ii: Find the size or dimension of the matrices in part **i**. (1 point)

Q2: Given (6 points)

$$A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 1 & 0 \\ 2 & -1 \end{bmatrix}.$$

Is it true that $A^2 - B^2 = (A - B)(A + B)$? Justify your answer.

Q3: **i:** Find the domain of $f(x) = \frac{\ln x}{1 - \ln x}$. (2 points)

ii: Solve $\log_x(1 - x) - \log_x 6 = 2$. (5 points)

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Q4: i: Find the sum of *(4 points)*

$$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \dots$$

ii: Find the tenth term of the geometric progression whose second and fifth terms are 24 and 81 respectively. *(5 points)*

Q5: *(4 points each)*

i: Which is better for the investor a semi-annual compounding with nominal rate 8%, or an annual compounding at 8.1%. Justify your answer.

ii: At what nominal rate of interest does money double in value in 10 years if compounded continuously?

Q6:

(6 points)

Mohammed borrowed 1800 Rials from his brother, and promised to pay his brother back in monthly installments. Each installment is more than the previous one by 10 Rials. If the amount of the first instalment is 50 Rials, then how long does it take Mohammed to pay the 1800 Rials back?

**End of Questions
Good Luck**
