Dawson College: **Business Mathematics**: 201-914-DW-S03: Fall 2008

Name: _____
Student ID: _____

Test 3

This test is graded out of 47 marks. No books, notes, graphing calculators or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Formulas:

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} \qquad \left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right) \qquad h = \frac{-b}{2a} \quad k = \frac{4ac-b^2}{4a}$$

$$I = Prt \qquad S = P + I = P(1+rt)$$

$$S = Pe^{rt} \qquad FV = PV\left(1+\frac{j}{m}\right)^{mt}$$

Question 1. *(9 marks)* Sketch the graph of $f(x) = 2^x$, $g(x) = \log_2(x)$ and $y = x$ on the same cartesian plane.

Question 2.

a. *(4 marks)* Express the logarithms as a single logarithm with a coefficient of one.

$$2\log(x+1)+\frac{1}{2}\log(x+2)-3\log(x+3)$$

b. *(2 marks)* $\log_4 2$

c. *(3 marks)* Solve for x.

$$\log(2x-4)=2$$

Question 3. John loans $900 for 100 days to Emma at a rate of 1.25% per year.

a. *(2 marks)* How much interest does Emma owe John?

b. *(2 marks)* What is the future value of the loan?

Question 4. *(4 marks)* What interest will be earned if $9 000 is invested for 19 months at 6% compounded continuously.

Question 5. Let $C(x) = 2x^2 + 100x + 3600$ be the cost function and $R(x) = 500x - 2x^2$ be the revenue function.

a. *(1 mark)* Find the profit function, $P(x)$.

b. *(4 marks)* Find the break-even point.

c. *(4 marks)* Find the number of items sold that maximize the profit function and find the maximum profit.

Question 6. *(4 marks)* How long *(in years)* would \$6 000 have to be invested at 12%, compounded quartely, to amount to \$35 400.

Question 7. *(4 marks)* A sum of \$25 000 would have to be invested at what interest rate to amount to \$30 000 in 200 days.

Question 8. *(4 marks)* What amount needs to be invested in order to have $6 200 in 199 days at a rate of 4.5% compounded daily.