MATH 205 EXAM 1

Thursday June 14, 2007

Instructor's Name:____________________ **Name:**___________________________

Calculators are permitted (in fact, you might find calculators necessary), but no books or formula sheets are allowed. Use the back pages as sketch paper. For full credit, show your work in detail. If you use a calculator at some step, you should state that you are doing so.

Total: 100	#1	#2	#3	#4	#5	#6	#7	#8

1 (12 pts). A deposit of \$40,000 is made into an account paying a fixed nominal yearly interest rate of 5%. Assuming that no further deposits or withdrawals are made, determine the amount in the account (to the nearest penny) in 10 years if the interest is compounded:

(a) (6 pts). Annually

(b) (6 pts). Monthly

2 (12 pts). Find the average rate of change of $f(x) = 2x^2$ between $x = 1$ and $x = 4$.

3 (12pts). Solve for x using natural logarithms:

(a) (6 pts). $5^x = 7$

(b) (6 pts). $e^{4x} = 100$

4 (15 pts). A movie theater has fixed costs of \$5,000 per day and variable costs averaging \$2 per customer. The theater charges \$7 per ticket.

(a) (10 pts). Find the cost and revenue functions and sketch a graph of them on the same axis.

(b) (5 pts). How many customers per day does the theater need in order to make a profit?

5. (12pts). Find the slope-intercept form of the equation for the line passing through the points $(-2, 1)$ and $(2, 3)$.

6 (13 pts). A product costs \$100 today. How much will the product cost in t days if the price is reduced by:

(a) (6 pts). \$5 a day

(b) (7 pts). 5% a day

7 (12pts). Find the doubling time of a quantity that is increasing by 9% per year (round your answer to the nearest whole year).

8 (12pts). Determine whether or not the function is a power function. If it is a power function write it in the form $y = kx^p$ and give the values of k and p.

(a. 4pts). $y = 5\sqrt{x}$

(b. 4pts). $y = 3x^2 + 4$

(c. 4pts). $y = 3 \cdot 5^x$