MATH 1090 SECTION 2 - SUMMER 2007 - PRACTICE FINAL

You have two hours to complete this test. Show all your work. Use your calculator only for computations The use of cell phones and laptops is not allowed.

question	grade	out of
1		10
2		15
3		10
4		15
5		10
6		15
7		10
8		10
9		15
total		110

Student Number: ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

(1) Solve the following equations:

(a) $2x^2 - x - 5 = 0$

(b) $\frac{1}{x} + 2 = \frac{x+1}{3}$

(2) Find the domain of definition of the following functions:

(a) $f(x) = \frac{2}{x-2}$

(b) $g(x) = \frac{1}{x} + \frac{2}{x-3}$

(c) $h(x) = \sqrt{x^2 - 8x + 12}$

(3) A businessman must decide whether to lease or buy a car. The cost per month for leasing the car is \$950 which also includes insurance fees. If he rents the car, the cost per mile (for gas, oil and such) is \$0.05. He can purchase a less expensive car for \$11,000 and then the cost per mile becomes \$0.07 per mile. What is the range of miles to drive for which leasing the car is the better option?

(4) (a) If the demand for a product is 300 units then the price per unit is \$50, and if the demand is 500 units then the price is \$40. Find the price as a function of the demand assuming it is linear.

(b) Find the revenue as a function of the demand.

(c) What is the demand that will maximize the revenue?

(5) You are given the choice of investing in option A at a nominal interest rate of 19% compounded quarterly, or in option B yielding a nominal interest rate of 20% compounded semi-annually. Which is the better option?

(6) If you put away \$500 in the end of each month in an annuity with APR $= 8\%$ compounded quarterly, how long will it take you to save at least \$350,000?

(7) Eddy borrowed $40,000 from the bank and will pay it off by three payments: $20,000 due two months from now, $10,000 due three months from now, and a final payment due 6 months from now. How much will the final payment be (at the time of the payment) if the nominal interest rate is 12% compounded monthly?

(8) A machine is purchased for \$3000 down and payments of \$250 at the end of every six months for six years. If the interest is at 8% compounded semiannually, find the price of the machine, after 6 years.

(9) Solve the following systems of equations. If there's no solution, write: no solution.

If there are infinitely many solutions, find the parametric solution.

(a)

$$\begin{cases} x - y - 2z & = & -8 \\ -x + 2y + 6z & = & 11 \\ 2x + 5z & = & -7 \end{cases}$$

(b)

$$\begin{cases} x - 3y & = & 3 \\ 2x - 6y + 2z & = & 14 \end{cases}$$