Test 2 - Math 1010 - NAME _____

Partial credit will be granted so do continue on with a problem even if you know that one part is wrong. **If part b) depends on part a), full credit can still be obtained for b) by showing the correct process for b).**

"Set up a formula with numbers substituted in for the variables" means that you should set up something similar to $100\,(1 + .049)^{100}$ (using the appropriate formula and numbers)

"**Show work**" means that you should show what numbers you plugged in to get an answer (ie 3*2 +1=7) but there is no need to explain in words.

PROBLEM 1): Condo [<u>55 Points</u> Dr. Sarah is taking out a loan to buy a condo. The interest rate was **6.75 % compounded** for 30 years (360 months). The loan amount was $84212.00.

a) Set up a formula with numbers substituted in for the variables in order to determine the required monthly loan payment [10 Points]

b) Solve for an answer for the required monthly payment [5 Points]

c) How much interest ($) does she pay in total over the life of the loan? Show work. [5 Points]

d) What is the interest ($) for the first month? Show work. [5 Points]

e) Why isn't the answer in part d) equal to the answer in part c) divided by 360, i.e. the average interest (where I obtained 360 by the number of months)? [10 Points]

Instead of paying the required monthly payment amount listed in part b), beginning with the first payment, she decides to pay $600 each month. On Excel, we see the following:

Month #	Monthly Payment	Monthly Interest($)	Principle Paid	Loan Balance
277	$600.00	$6.01	$593.99	$473.73
278	$600.00	$2.66	$597.34	($123.61)

f) Use this Excel to determine how much she pays in total now. Show work. [5 Points]

g) How much total interest ($) does she pay over the life of the loan now? Show work. [5 Points]

h) How much total interest ($) did she save or lose by paying $600 a month instead of the required monthly payment from part b)? Show work. [5 Points]

i) Set up an equation with numbers that would have solved for how long it would take to pay off the loan this way (by paying $600 each month over the entire life of the loan) if I didn't have the Excel chart to give me the answer, but **DO NOT SOLVE.** [5 Points]

PROBLEM 2): Big Picture Reflection

a) How did we obtain the periodic payment formula? Give enough information about the philosophy of derivation so that that someone could understand where the -1 came from.

b) What is a positive consequence of taking a lump sum payout in the lottery?

c) What is a negative consequence of taking a lump sum payout in the lottery?

d) How does chance and probability relate to the lottery?