MTH 1210, FALL 2013
DR. GRAHAM-SQUIRE

SECTION 4.6: IN CLASS ACTIVITY

1. Names

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2. Instructions

Read the problem given below, then work on it with the other members of your group. You should give a complete answer with all of your work shown for each question. It is fine for different people to work on different parts of the question, but you should check each other's work since everyone in the group will receive the same grade for the assignment. If you have any questions, ask the other members of your group first. If all of you are stuck, everyone in the group must raise their hand in order to get help from the professor. Attach this as a cover sheet to the work you turn in.

3. Modeling Population

Assuming that a particular situation follows an exponential growth model, you can create an exponential model as long as you know what the population was at two different times. Generally the first 'time' is given by the initial population, but sometimes it is not. In the exercise below you will create an exponential growth model for the population of the world.

Exercise 1. In 1950, the population of the world was estimated to be 2,532 million. In 1960 it had grown to 3,038 million. Let $t = 0$ represent the year 1900 (so 1950 would correspond to $t = 50$, for example).

(a) Set up an equation representing the exponential growth model for the world population in 1950. You should be able to put numbers in for all variables except for P (initial population) and r (growth rate).

(b) Set up a similar equation for the world population in 1960.

(c) You should now have two equations that both have the variables P and r in them, and no other variables. Solve one of the equations for the variable P (that is, move stuff around so that you have an equation that has P by itself on one side of the equation) and then substitute it in to the other equation. You should now use exponent rules and techniques of solving exponential equations to solve for the growth rate r.

(d) Use your value of r to find the value of P.

(e) Use your population model (with the values of r and P that you just found) to estimate the world's population in 2013.

(f) The actual world population is 7,130 million. How far off was your estimate, and why do you think it was so far off (or so close, if that is the case).