**MTH133**

**Unit 4 Group Project – A**

**Name:**

Your group will develop four different population scenarios for a town. As a group, you will decide on the name of the town and the initial population. You will graph the function for each population scenario and use your model to make some decisions about the population.

1) 1) Decide on a name of a rural town. Name of town: Home Town USA

2) Decide on an initial population, , of the town in the year 2010. Initial population will be 4500. Use this value of  for each of the scenarios. *P*0 = \_\_\_\_\_\_\_\_\_\_\_

3) You will investigate four different scenarios of population growth or decline in this town.

* Linear growth
* Growth modeled by a quadratic equation
* Growth modeled by a radical equation
* Population decline modeled by a rational equation

**I. Linear Growth:**

 Suppose that the amount that your town’s population grows each year is fixed (or constant).

 Choose the amount of population growth each year = \_\_\_\_\_\_\_

 (Hint: Choose a whole number for your growth rate, rather than a percent.)

 a) Fill in the following chart:

Click in this box and type the name(s) of the student(s) who uploaded this problem (I) and who checked it for accuracy.

Done by:

Checked by:

|  |  |
| --- | --- |
| Year (*t*) | Population (*P*) |
| *t* = 0(2010) | \_\_\_\_\_\_ |
| *t* = 1(2011) |  |
| *t* = 2(2012) |  |
| *t* = 3(2013) |  |
| *t* = 6(2016) |  |

 b) Find a linear equation in the form *P* = *mt* + *b* (*y* = *mx* + *b*), which gives the population, *P*, *t* years from 2010.

 Answer:

 Show your work here:

 c) Use your equation in part b to approximate the population in the year 2030.

 Answer:

 Show your work here:

 d) Use your equation in part b to approximate how many years it will take the population to reach 7000.

 Answer:

 Show your work here:

 e) Graph this function in MS Excel by plotting the points found in your chart in part a. Label your axes with time on the *x*-axis and population on the *y*-axis. Copy and paste your graph here:

Answer:

Cite All References APA Style