Income Data Worksheet Name:_____KEY_____

1. Determine equations to represent income growth for the USA, New York, District of Columbia, and Louisiana. Round numbers to 3 decimal places, or as instructed by your teacher.
   * See note below with question # 5

USA: $y = 2.133 \times 10^{-29} * 1.039^{x}$

NY: $y = 3.570 \times 10^{-27} * 1.036^{x}$

D.C.: $y = 1.029 \times 10^{-37} * 1.049^{x}$

LA: $y = 2.260 \times 10^{-28} * 1.038^{x}$

2. Using the equations above, determine the rate of growth as a percentage for each region. Recall that $A=A_0(1+r)^x$. Show your work for determining each percentage.

USA:_3.9__%

NY:___3.6__%

DC:__4.9___%

LA:__3.7___%

3. Unlike the other regions, Louisiana's data takes a surprising "dip". What likely explains this decrease?

   The devastation of Hurricane Katrina in 2005 dramatically damaged the state's economy. Workers were displaced, businesses were destroyed, and wages were lost due to time out of work.

4. Based on the models you created in question #1, predict the income in 2010 for each of these regions. Show work, or explain how you arrived at your predictions. Note- these predictions were made from the graph screen by pressing menu, 6: Points & Lines, 2: Point on. The cursor was then moved to a point on a selected curve and enter was pressed to drop a point. The x-coordinate was then changed for each to 2005 by clicking on the x-coordinate to make it editable text. Once the change to 2010 is made, press enter, and a new point with 2010 as the x-coordinate will appear with a new y-coordinate. The window may need to be adjusted on the graph to allow such a point to be placed. The window can also be adjusted through the menu options.

   *The use of the rounded equations from question #1 is not recommended as the rounding produces significant errors in calculations. The equations in #1 are primarily useful in obtaining the growth factor. In order to obtain an A_0 that makes more sense, students could use elapsed time since 1990 instead of the actual years.

USA: $42,210

NY: $48,628

DC: $68,076

LA: $32,194

5. Based on your models, in what year can Louisiana residents expect their average per capita income to reach the 2005 Washington D.C. income level?

   toward the end of the year 2023 or around mid- 2024 depending upon if this judgment is made using the regression equations alone, or with use of the D.C. 2005 income from the spreadsheet