Math 105 - Team Homework Assignment 5, Fall 2012

- **Due Date:** October 18 or 19, 2012 (Your instructor will tell you the exact date and time.)

- Remember that all solutions to the Team Homework problems must be written out in complete sentences, showing all of your work - in much the same way that your textbook explains the example problems in each section. Please refer to more specific instruction under the “Doing Team Homework” and “Team HW Tutorial” links in the sidebar of the course website.

- **Do not forget to rotate roles and include a reporter’s page each week.**

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1. *(Based on 4.R.44)* Find the annual percent growth or decay rate of a quantity which:
   - (a) doubles in size every 9 years
   - (b) triples in size every 13 years
   - (c) grows by 4% per month
   - (d) decreases by 3% every 5 months
   - (e) decreases at a continuous rate of 27% per year

2. *(Based on 4.5.50)* The data in Table 4.15 on page 167 of the book gives the annual inflation rate $r$ for each of five years. Use the data in this table to answer the questions below.
   - (a) If the price of an item was $100 at the beginning of 2000, how much did it cost at the beginning of 2001? 2002? 2003? 2004? at the end of 2004?
   - (b) By what total percent did prices rise between the start of 2000 and the end of 2004?
   - (c) What was the “average annual inflation rate” for this time period? (In other words, if the inflation rate had been the same every year, what would this rate have needed to be in order to result in the same answer to part (b)?)
   - (d) Use the average inflation rate you found in (c) to predict the cost of a shower curtain in 2012 if the cost was $20 at the beginning of 2000.
   - (e) Use a graph to estimate the year in which the shower curtain from (d) will cost $40 (assuming the average inflation rate doesn’t change). Then do the same for $50 and for $60.

3. Do Problem 4.3.46 on page 155.
   Note: For part (b), use the same values of $x$ in your window, but for one or more of the functions, you may need to adjust the values of $y$ in order to actually see the graph.


5. Do Problem 4.R.76 on page 172. In addition, do part (g) below.
   - (g) What should happen if you evaluate $(1 + 1/x)^x$ for extremely large values of $x$?
     Check what happens if you evaluate this for $x = 10^{20}$ on a calculator. What about on WolframAlpha? Also try it for $x = 10^{100}$ and $x = 10^{200}$. Explain what you find.