Homework problems due on Thursday, Sept. 6

Exercise 1.1: Show that the solution of $x' = re^{-at}x$, $x(0)=1$ is the same as the solution of $x' = rx - ax \ln x$ with $x(0)= 1$.

Exercise 1.2: **True or false? Show your work in detail.** A single cell of the bacterium E. coli would, under ideal circumstances, divide every twenty minutes. … it can be shown that in a single day, one cell of E. coli could produce a super-colony equal in size and weight to the entire planet earth.

Exercise 1.3: **Problem 5, page 152.**

Exercise 1.4: If this were a harvested population, where would you like to maintain the population size in order to manage for Maximum Sustained Yield (MSY)? (Hint: Assume that the population is harvested at the rate of *C*/unit of time, then the population grows according to $dN/dt = rN(1-N/K)-C$.)

Exercise 1.5: **Problem 2(a, c), page 29**

Exercise 1.6: **Problem 3, page 29**

Exercise 1.7: **Problem 9, page 31. Use Matlab to graph the solutions with n=20.**

Exercise 1.8: **Problem 15, page 33.**

Exercise 1.9: **Problem 16, page 33.**

Exercise 1.10: **Problem 19, page 34.**

Exercise 1.11: **Problem 20, page 35.**