Homework 16: Differential Equations

Problem 1

Solve the following ODE

$$\frac{dy}{dt} = ye^{-t}$$

to $t = 6$. Plot the resulting function $y(t)$. The initial condition is $y_0 = 1$.

Problem 2

For the following first order reaction $A \rightarrow B$, solve for the concentration of A in time if the initial concentration $A_0 = 1.0$, and the reaction rate is given by

$$\frac{dC_A}{dt} = -kC_A.$$

where k=2.0.

Part a

Make a plot of C_A versus time.

Part b

Calculate the product composition, $C_B(t)$ by solving the additional equation

$$\frac{dC_B}{dt} = kC_A.$$

Include it on the plot of Part a.