

Homework due Wednesday, September 12

Do the following problems:

1. Find numbers a and b so that the function $y(t) = e^{at} + bt^2$ solves the differential equation $\frac{dy}{dt} = 3y - 6t^2 + 4t$.

2. a) Find the general solution of

$$\frac{dy}{dt} = y^3 t.$$

b) Find particular solutions of the diff. equation in a) satisfying $y(0) = 1$, $y(0) = -1$, $y(0) = 0$.

3. A 100 gal. tank initially contains 50 gal. of milk and 3 gal. of chocolate. We are adding 2 gal. of chocolate per minute to the tank and removing mixture at a rate of 2 gal of mixture per minute.

a) Set up an initial value problem for the amount of chocolate in a tank at time t .

b) How would you adjust differential equation if we add 4 gal of chocolate per minute, but still removing only 2 gal of mixture per minute.