Problem 3:

Theory suggests that this initial value problem has a stability region where abs(1+h\*lambda)<=1. Therefore, the solution should become unstable in each case as follows:

lambda = -10, h\_unstable = 0.2

lambda = -100, h\_unstable = 0.02

lambda = -1000, h\_unstable = 0.002

See the plots below. These show the Forward Euler solution and the error of the Forward Euler solution for each value of lambda and a range of values of h. By looking at the error plots we see that, for each value of lambda, the Forward Euler solution is stable when h is smaller than h\_unstable, but becomes unstable at when h equals h\_unstable.

INCLUDE PLOTS!!!!

Problem 4: