HW #2 for Math 425, Due Monday: September 23

• From Brauer and Nohel
  – section 1.4 # 2
  – section 1.6 # 8,10,11

• Consider the IVP:

\[ y' = 2(y + 1) \quad y(0) = 0 \]

Use the method of successive approximations to obtain a sequence of functions \( \phi_n(t) \) that converge to the solution.

– Find an expression for an arbitrary \( \phi_n(t) \).
– Confirm that the sequence does indeed converge for every \( t \). **Hint:** Use the ratio test.
– Confirm that \( \phi(t) = \lim_{n \to \infty} \phi_n(t) \) is a solution to the IVP.
– Confirm that the solution found analytically (by separation of variables or integrating factors) is the same as that found by the method of successive approximations.

**Note:** We will be meeting Wednesday September 18 in the Computer Lab (room 139 Hammermill). We will check into using Maple to help with the integration involved in solving a differential equation by the method of successive approximations.