

Sept 4, 2003

Homework 1

- Solve the initial value problem (logistic growth)

$$dy/dx = ry(k - y), \quad y(0) = y_0.$$

Plot the solution.

- Solve the initial value problems (separation of vars)

$$y^3 y' + x^3 = 0, \quad y(0) = 1,$$

$$xy' + y = 0, \quad y(2) = -2.$$

- Solve the 2nd order initial and boundary value problems:

$$y'' + y' - 6y = 0, \quad y(0) = 10, \quad y'(0) = 0,$$

$$y'' + 4y' + 4y = 0, \quad y(0) = 1, \quad y'(0) = 1,$$

$$y'' + 2y' + 2y = 0, \quad y(0) = 1, \quad y(\pi/2) = 0.$$

Show each step.