First-Order Linear Differential Equations
Math 230

Solve the linear differential equations by completing the following steps:

(a) Write the associated homogeneous equation and find its general solution $ky_h(t)$.

(b) Find *any* particular solution $y_p(t)$ to the nonhomogeneous equation.

(c) The general solution to the nonhomogeneous equation is $ky_h(t) + y_p(t)$.

(d) Check your solution by plugging it back in to the nonhomogeneous equation.

1. $\dfrac{dy}{dt} = 3y + e^{-t}$

2. $\dfrac{dy}{dt} = -y + \sin(t)$

3. $\dfrac{dy}{dt} = y + e^t$

4. $\dfrac{dy}{dt} = y + t + e^{2t}$