MTH 302: Linear Algebra and Differential Equations

Activities for Tuesday March 21

1. **(AA 8)** Find the general solution for the system

$$\frac{dx}{dt} = 5y, \frac{dy}{dt} = -2x$$

2. Find the particular solution to the above system if $x(0) = 1$ and $y(0) = 4$.
3. Earlier in the course we looked at a mass-spring system that led to a second-order differential equation:

   $y'' + y' + 6y = 0$

   where y represents the distance of the mass from its natural resting position, as a function of time. Convert this into a system of two first-order equations. (Hint: Let $u = y'$ and then the system will involve dy/dt and du/dt.) Then find a formula for y as a function of t given that $y(0) = 1$.