Math 2410-10/15 **Quiz #5** **March 6^{th}, 2017**

Note: Partial credit can not be awarded unless there is legible work to assess.

1. Find the general solution of the following system.

$$\frac{dx}{dt} = 3x$$
$$\frac{dy}{dt} = x + y$$

You may report your answer in vector notation $\mathbf{Y}(t)$ or as two functions $x(t)$ and $y(t)$.

2. Considering the following second-order differential equation.

$$\frac{d^2x}{dt^2} + 6\frac{dx}{dt} - 7x = 0 \tag{1}$$

(i) Convert (1) into a system of first-order differential equations by letting $\dfrac{dx}{dt} = y$.

(ii) Give two solutions to (1).