Quiz 4 10 points Math 220 Name: _____

1. (3 points) Use variation of parameters to find the general solution for $y'' + 3y' + 2y = 4e^{-x}$.

2. (3 points) Solve $\vec{u}' = A\vec{u}$ if $A = \begin{bmatrix} 4 & 3 \\ 1 & 2 \end{bmatrix}$ and $\vec{u}(0) = (1, 2)$.

3. (a) (3 points) Find the general solution for $\vec{u}' = A\vec{u}$ if $A = \begin{bmatrix} 4 & 5 \\ -1 & 2 \end{bmatrix}$.

(b) (1 point) If $\vec{u}(0) = (a, b)$ where $a \neq 0$, then the solution is a spiral in the phase plane. Does it rotate counterclockwise or clockwise and how do you know?