Quiz 5 Math 3600 Show your work
Dec 2, 2016

[5] 1.) Circle T for True and F for false:

1a.) If ϕ is a solution to a first order **linear homogeneous** differential equation, then $c\phi$ is also a solution to this equation. T F

1b.) If ϕ is a solution to a first order linear differential equation, then $c\phi$ is also a solution to this equation. T F

[6] 2. Suppose $A\begin{bmatrix}5\\6\end{bmatrix} = \begin{bmatrix}5\\13\end{bmatrix}$, $A\begin{bmatrix}3\\5\end{bmatrix} = \begin{bmatrix}9\\15\end{bmatrix}$, $A\begin{bmatrix}-1\\3\end{bmatrix} = \begin{bmatrix}17\\19\end{bmatrix}$, $A\begin{bmatrix}2\\1\end{bmatrix} = \begin{bmatrix}-4\\-2\end{bmatrix}$

State the 2 eigenvalues of A: _____

State 5 eigenvectors of A:

3.) Given the non-linear system of equations $\frac{dx}{dt} = x - 2$ and $\frac{dy}{dt} = x(y-1)^2$,

[7] 3a.) The critical point of this system is _____.

[8] 3b.) The corresponding linear system near this critical point is _____

[7] 3c.) The eigenvalues of this linear system are _____.

[7] 3d.) What conclusions can you then draw about the non-linear system: