

Quiz 4 SHOW ALL WORK

Nov 9, 2018

[15] 1.) Solve  $ty' + 4y = t$

Answer: \_\_\_\_\_

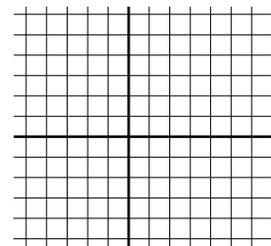
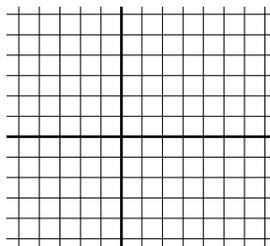
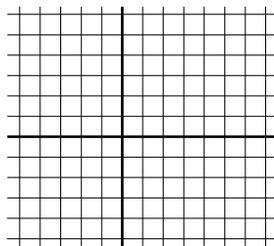
1.) Give that the solution to  $\mathbf{x}' = \begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix} \mathbf{x}$  is  $\mathbf{x} = c_1 \begin{bmatrix} 1 \\ 1 \end{bmatrix} e^{3t} + c_2 \begin{bmatrix} -2 \\ 3 \end{bmatrix} e^{-2t}$

[4] a.) Graph the solution to the IVP  $\begin{bmatrix} x_1(0) \\ x_2(0) \end{bmatrix} = \begin{bmatrix} -2 \\ 3 \end{bmatrix}$  in the

$t, x_1$ -plane

$t, x_2$ -plane

$x_1, x_2$ -plane

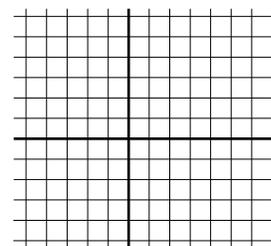
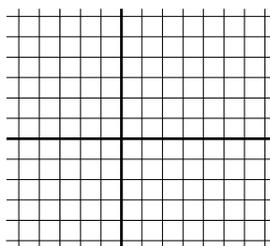
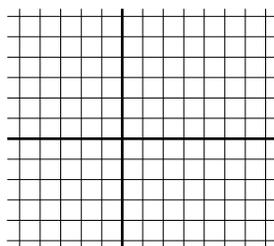


[2] b.) Graph the solution to the IVP  $\begin{bmatrix} x_1(0) \\ x_2(0) \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$  in the

$t, x_1$ -plane

$t, x_2$ -plane

$x_1, x_2$ -plane

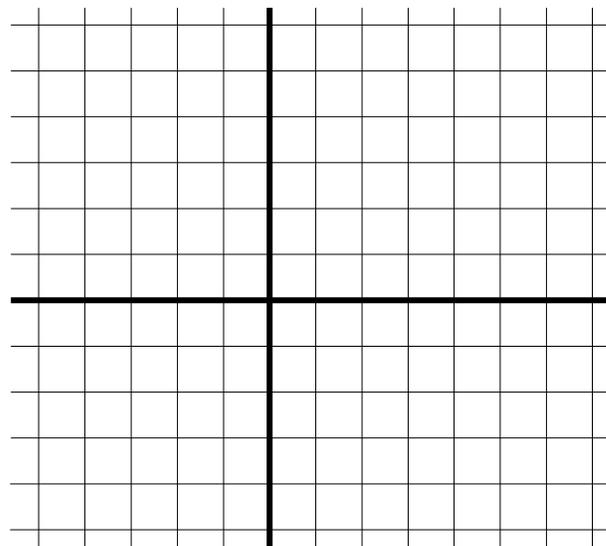
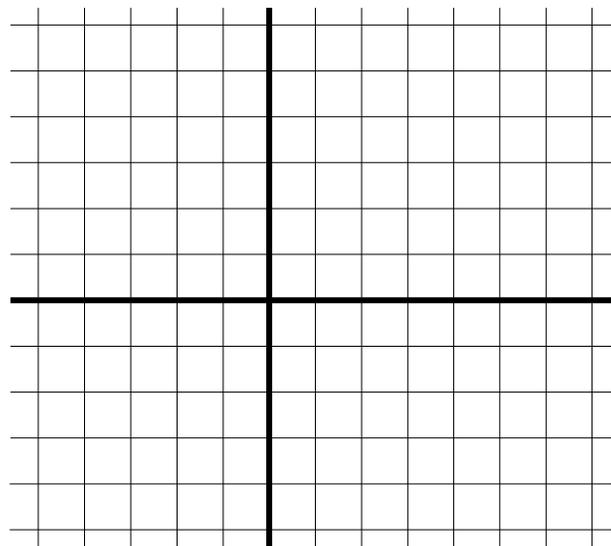


[2] c.) The equilibrium solution for this system of equations is  $\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} \phantom{0} \\ \phantom{0} \end{bmatrix}$ .

[2] d.) Determine the stability and type of this equilibrium solution: \_\_\_\_\_

[1] e.)  $\frac{dx_2}{dx_1} =$  \_\_\_\_\_

[9] f.) Graph several trajectories.



extra graph: use only if you wish to

graph for part f