Name: _____ **Sort #:** _____

Worksheet 22: Repeated Eigenvalues

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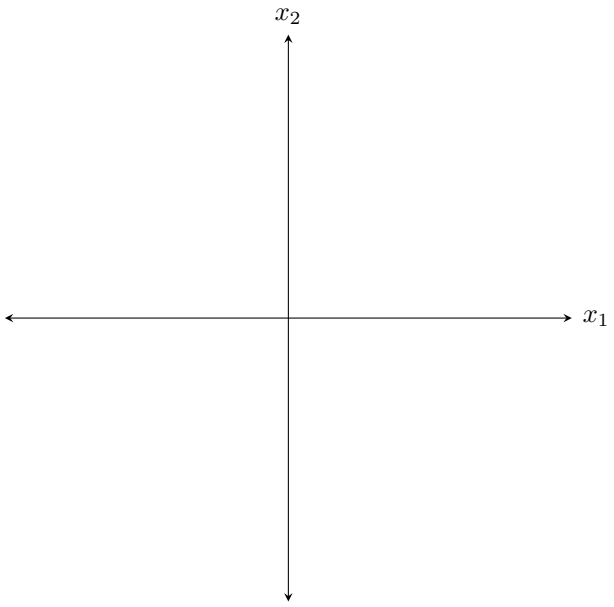
1. (20 pts) Solve the system of equations

$$\frac{d\mathbf{x}}{dt} = \begin{bmatrix} 1 & -4 \\ 4 & -7 \end{bmatrix} \mathbf{x}, \quad \mathbf{x}(0) = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$$

and draw a phase portrait for the system on the axes provided to the right.



2. (20 pts) Find the general solution to the system of equations

$$\frac{d\mathbf{x}}{dt} = \begin{bmatrix} 7 & 1 \\ -4 & 3 \end{bmatrix} \mathbf{x}$$

and draw a phase portrait for the system on the axes provided to the right.