

Quiz 1. Diff.Eq. 2016.03.08

1. (4+6)

$$\frac{d}{dt} \begin{pmatrix} y_1 \\ y_2 \\ y_3 \end{pmatrix} = \begin{pmatrix} y_2^2 - 9 \\ y_1 - 2 \\ 2 - y_3 \end{pmatrix}.$$

Find the fixed points of the DE!

Write down the linearized DEs around the fixed points!

2. (4+3+3)

$$\begin{pmatrix} y_1' \\ y_2' \end{pmatrix} = \begin{pmatrix} 4y_1 + 3y_2 \\ 5y_2 \end{pmatrix} = A \begin{pmatrix} y_1 \\ y_2 \end{pmatrix}, \quad \begin{pmatrix} y_1(0) \\ y_2(0) \end{pmatrix} = \begin{pmatrix} 6 \\ 8 \end{pmatrix}$$

Find the eigenvalues and eigenvectors of A !

Write down the general solution!

Write down the particular solution!