

Math 309 Quiz 1

April 7, 2016

Problem 1. Suppose that A is an $n \times n$ matrix, and that \vec{v} is an eigenvector of A with eigenvalue λ . Show that $y = e^{\lambda t}\vec{v}$ is a solution to the differential equation

$$\frac{d}{dx}\vec{y} = A\vec{y}.$$

Problem 2. Find the general solution of the differential equation

$$\frac{d}{dx}\vec{y} = A\vec{y}, \quad A = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}.$$