

# M 327J - Differential Equations with Linear Algebra

🦉 October 31, 2022 🦉

## Quiz 6 😊

1. [5 points] Suppose the matrix  $A$  has eigenvalues  $1, -1$  with corresponding eigenvectors

$$\begin{pmatrix} 1 \\ 2 \end{pmatrix} \text{ and } \begin{pmatrix} -2 \\ 1 \end{pmatrix}$$

respectively. Use this information to solve the initial value problem

$$\begin{cases} \frac{d}{dt}\vec{x}(t) = A\vec{x}(t) \\ \vec{x}(0) = \begin{pmatrix} 0 \\ 15 \end{pmatrix} \end{cases}$$

2. [5 points] Find the general solution to the problem

$$\frac{d}{dt}\vec{x}(t) = \begin{pmatrix} 0 & -1 \\ 4 & 0 \end{pmatrix} \vec{x}(t)$$