

WORKSHEET 9/15/22
MATH 2331, FALL 2022

- (1) Can the vector $\vec{b} = (2, 3)$ be expressed as a linear combination of the vectors $\vec{v}_1 = (0, 3)$ and $\vec{v}_2 = (1, 2)$?
- (2) In this problem, you'll consider the matrix $A = \begin{bmatrix} 0 & 1 \\ 3 & 2 \end{bmatrix}$.
 - (a) Calculate $A\vec{x}_1$, $A\vec{x}_2$, and $A\vec{x}_3$, where $\vec{x}_1 = (1, 1)$, $\vec{x}_2 = (2, 1)$ and $\vec{x}_3 = (3, 2)$. What do you notice?
 - (b) Calculate $A\vec{x}_1$ and $A\vec{x}_4$, where $\vec{x}_4 = (5, 5)$. What do you notice?
- (3) Using the same matrix as before, calculate $A\vec{e}_1$ and $A\vec{e}_2$, where $e_1 = (1, 0)$ and $e_2 = (0, 1)$. What do you notice?
- (4) Calculate AB and BA , where A is as before and $B = \begin{bmatrix} 1 & -1 \\ -1 & 2 \end{bmatrix}$. What do you notice?
- (5) Calculate I_2A and AI_2 where $I_2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$. What do you notice?