

WORKSHEET 1/23/23
MATH 2331, SPRING 2023

- (1) Let $A = \begin{bmatrix} 0 & 1 \\ 3 & 2 \end{bmatrix}$. Calculate $A\vec{e}_1$ and $A\vec{e}_2$, where $e_1 = (1, 0)$ and $e_2 = (0, 1)$. What do you notice?
- (2) Calculate AB and BA , where $A = \begin{bmatrix} 0 & 1 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 \\ -1 & 2 \end{bmatrix}$. What do you notice?
- (3) Calculate I_2A and AI_2 where $I_2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$. What do you notice?
- (4) Let $\vec{v} = (1, 0)$ and $\vec{w} = (0, 2)$. Draw the vectors $A\vec{v}$ and $A\vec{w}$ where A is each of the following matrices.

(a) $\begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$

(b) $\begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}$

(c) $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$

(d) $\begin{bmatrix} \frac{\sqrt{3}}{2} & -\frac{1}{2} \\ \frac{1}{2} & \frac{\sqrt{3}}{2} \end{bmatrix}$

(e) $\begin{bmatrix} 1 & 0 \\ \frac{1}{3} & 1 \end{bmatrix}$

(f) $\begin{bmatrix} 1 & -2 \\ 2 & 1 \end{bmatrix}$