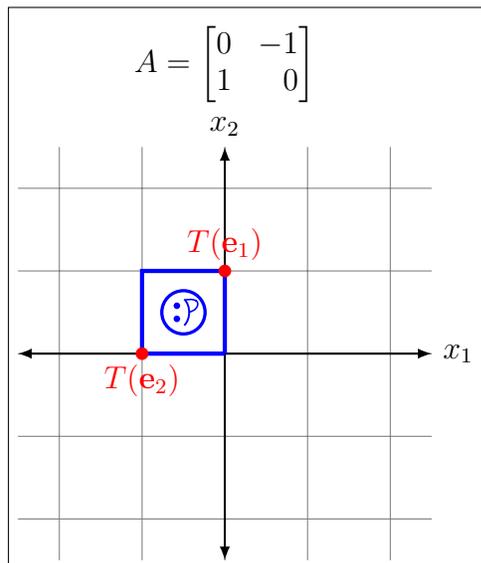
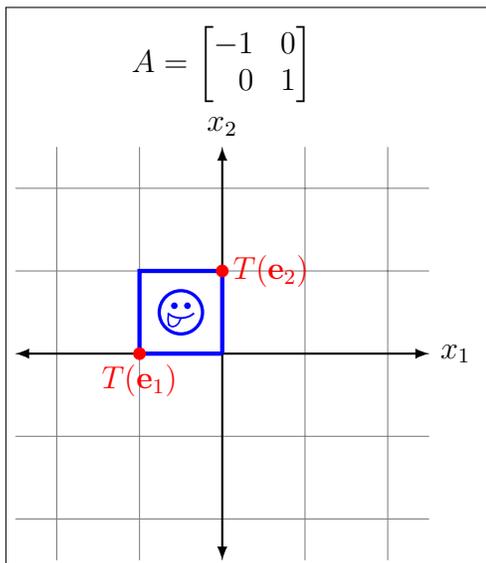
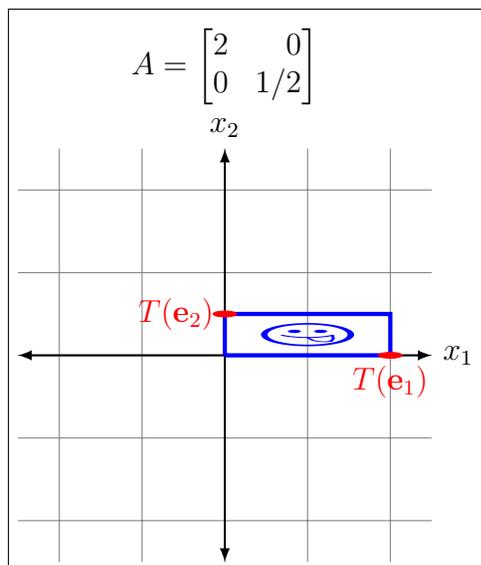
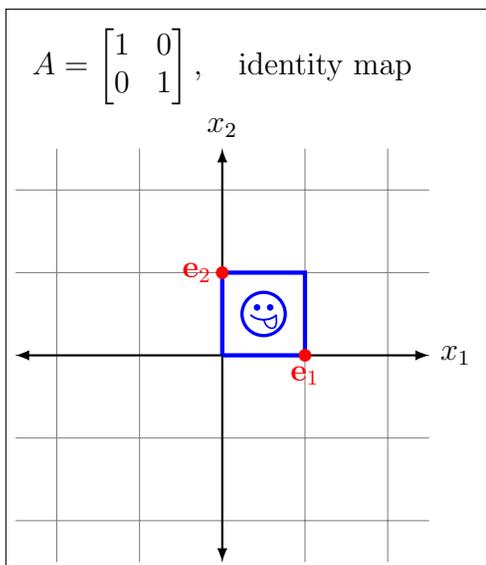


## MATH 22 LECTURE 06 CLASSWORK: ANSWERS

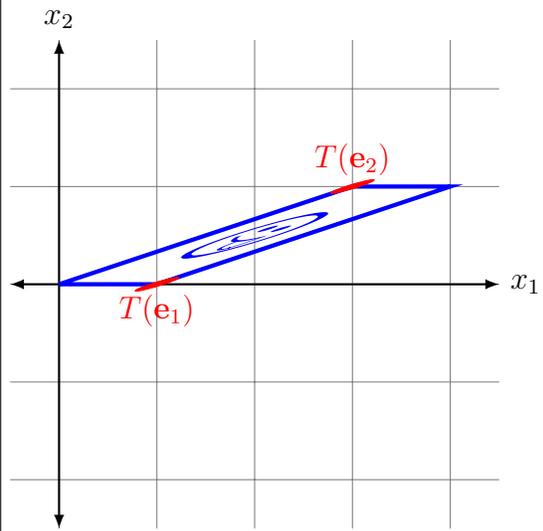
JULY 03, 2017

Let  $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$  be defined by  $T(\mathbf{x}) = A\mathbf{x}$  where  $A$  is a  $2 \times 2$  matrix. For each specific  $2 \times 2$  matrix  $A$  below please do the following:

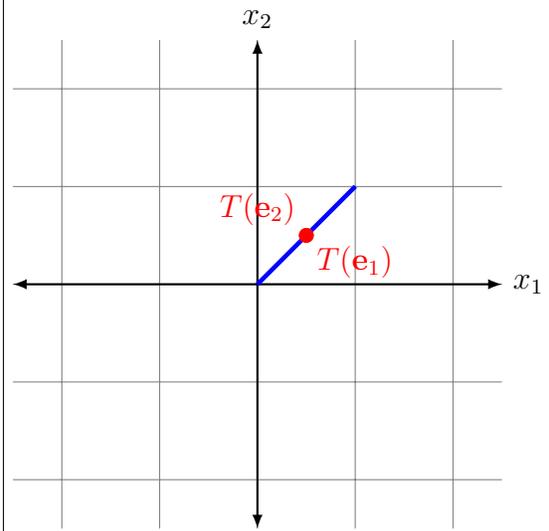
- (i) Draw where the standard unit vectors  $\mathbf{e}_1$  and  $\mathbf{e}_2$  are mapped by  $T$ .
- (ii) Draw where the unit square is mapped by  $T$ .
- (iii) Describe the map in words.
- (iv) Sketch what  $T$  does to the smiley face.



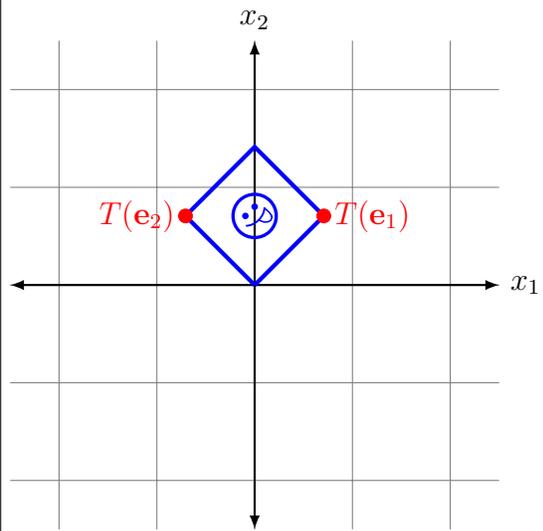
$$A = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$$



$$A = \begin{bmatrix} 1/2 & 1/2 \\ 1/2 & 1/2 \end{bmatrix}$$



$$A = \begin{bmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{bmatrix}, \quad \theta = \pi/4$$



$$A = \begin{bmatrix} 1 & -1 \\ -1 & 2 \end{bmatrix}$$

