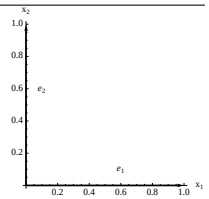
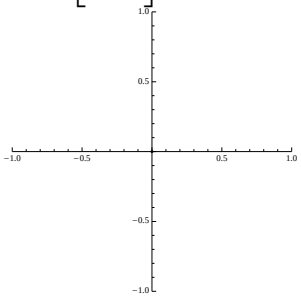
Math 21b, TTh 11:30 Section, Lecture 3, In Class Exercise
Linear Transformations

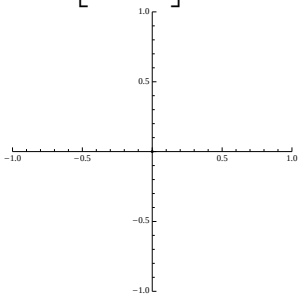


Apply the following linear transformation T for $T = A, B, C, D, E, F$ to the base vectors $e_1 = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$ and $e_2 = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$ and draw the resulting Te_1 and Te_2 for each of the given Ts.

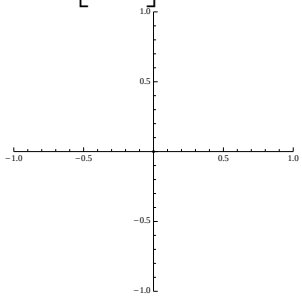
$A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$



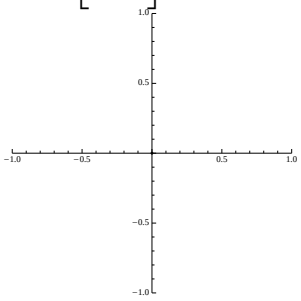
$B = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$



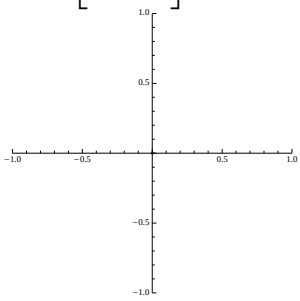
$C = \begin{bmatrix} 2 & 0 \\ 0 & 1 \end{bmatrix}$



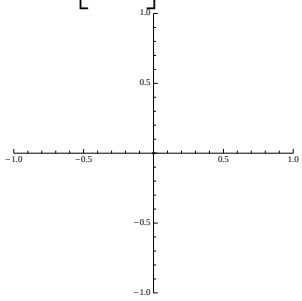
$D = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$



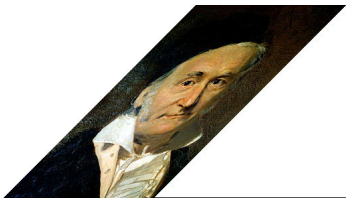
$E = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$



$F = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$



When we apply some of these linear transformations to Gauss's picture we get the following images. Determine which linear transformation was applied in each case.



(I)

(II)

(III)

(IV)