Images of F

Please discuss the following transformations and the resulting image of F when you perform the following transformations:

a) transformations with matrices of the form $\begin{pmatrix} k & 0 \\ 0 & 1 \end{pmatrix}$.

b) transformations with matrices of the form $\begin{pmatrix} 1 & 0 \\ 0 & k \end{pmatrix}$.

c) transformations with matrices of the form $\begin{pmatrix} k & 0 \\ 0 & k \end{pmatrix}$.

d) transformations with matrices of the form $\begin{pmatrix} 0 & k \\ k & 0 \end{pmatrix}$.

e) transformations with matrices of the form $\begin{pmatrix} 1 & 0 \\ k & 1 \end{pmatrix}$.

f) transformations with matrices of the form $\begin{pmatrix} 1 & k \\ 0 & 1 \end{pmatrix}$.

Set up the following matrices one at a time. Pay particular attention to the lattice points of F and to the lattice points of the IMAGE of F.

(a) $\begin{pmatrix} 2 & 3 \\ 0 & 1 \end{pmatrix}$ (b) $\begin{pmatrix} 1 & 0 \\ 3 & -1 \end{pmatrix}$ (c) $\begin{pmatrix} 1 & 2 \\ 3 & 1 \end{pmatrix}$ (d) $\begin{pmatrix} 2 & -1 \\ 2 & 1 \end{pmatrix}$ (e) $\begin{pmatrix} -2 & 1 \\ 2 & -1 \end{pmatrix}$ (f) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

Set up the matrices for the following transformations. Pay attention to the orientation of the vectors!

- Reflection over the x – axis.
- Reflection over the line $y = -x$
- 90-degree clockwise rotation around the origin.
- Half-turn around the origin
- 90-degree counter clockwise rotation around the origin
- Refection over $y = x$.