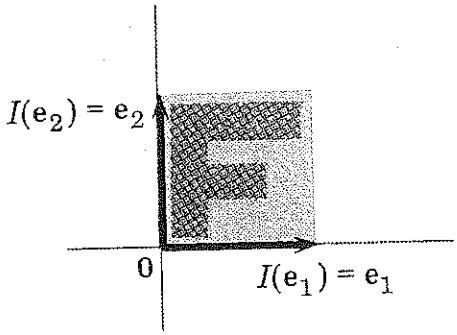
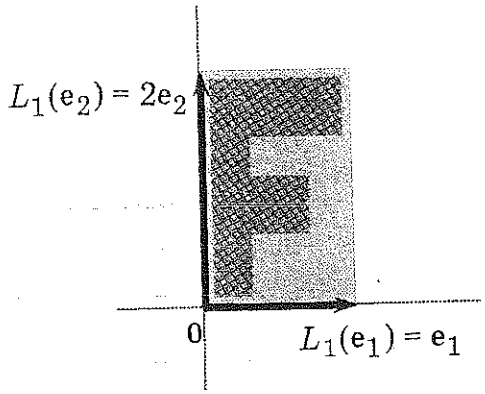
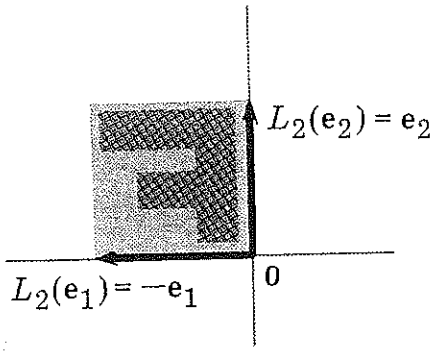
3. Linear Functions



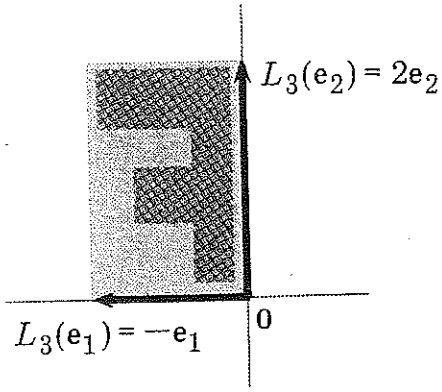
(*a*) Identity $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$



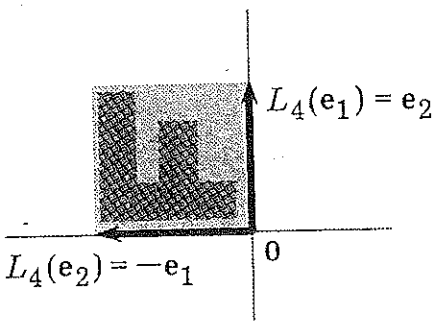
(*b*) Stretching $L_1 = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$



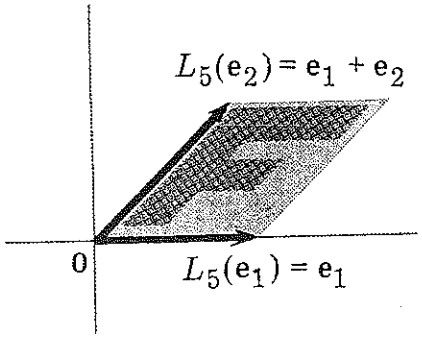
(*c*) Reflection $L_2 = \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$



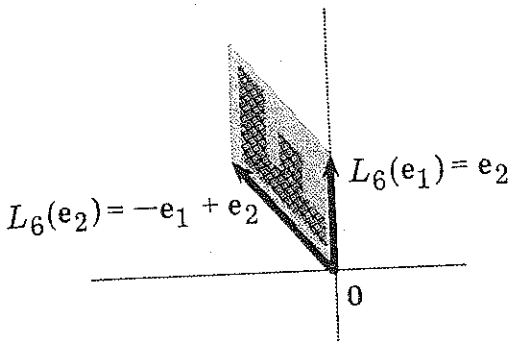
(*d*) Stretching and reflection
$L_3 = \begin{bmatrix} -1 & 0 \\ 0 & 2 \end{bmatrix}$



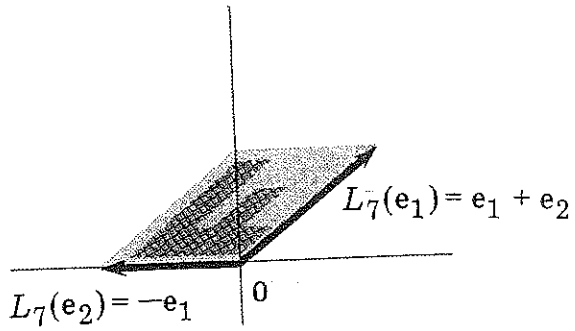
(*e*) Rotation $L_4 = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$



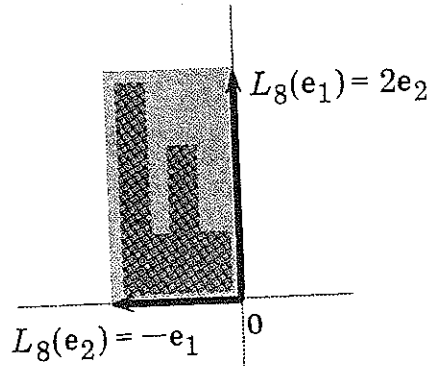
(*f*) Shear $L_5 = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$



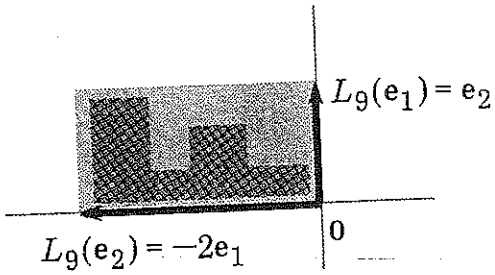
(*g*) Shear and rotation $L_6 = \begin{bmatrix} 0 & -1 \\ 1 & 1 \end{bmatrix}$



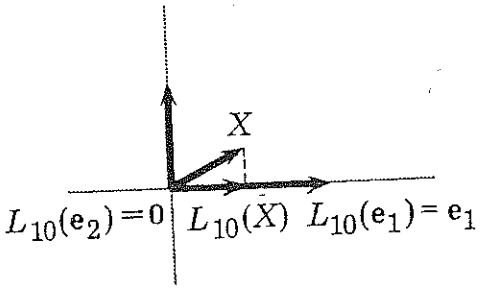
(*h*) Rotation and shear $L_7 = \begin{bmatrix} 1 & -1 \\ 1 & 0 \end{bmatrix}$



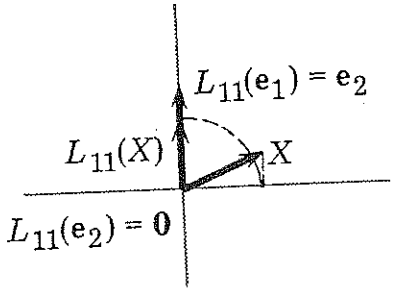
(*i*) Rotation and stretching
$L_8 = \begin{bmatrix} 0 & -1 \\ 2 & 0 \end{bmatrix}$



(*j*) Stretching and rotation
$L_9 = \begin{bmatrix} 0 & -2 \\ 1 & 0 \end{bmatrix}$



(*k*) Projection $L_{10} = \begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$



(*l*) Projection and rotation $L_{11} = \begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix}$