7.7.2

F byter plats på $\bar{e}_1 + 2\bar{e}_2$
och $2\bar{e}_1 + \bar{e}_2$.

Ange avb. matris A_e

Bestäm $\bar{f}_1, \bar{f}_2$ så att $F(\bar{f}_1) = \bar{f}_1$
$F(\bar{f}_2) = -\bar{f}_2$

Ange A_f.

$$\begin{cases} F(\bar{e}_1 + 2\bar{e}_2) = 2\bar{e}_1 + \bar{e}_2 \\ F(2\bar{e}_1 + \bar{e}_2) = \bar{e}_1 + 2\bar{e}_2 \end{cases} \Leftrightarrow \begin{cases} F(\bar{e}_1) + 2F(\bar{e}_2) = 2\bar{e}_1 + \bar{e}_2 \\ 2F(\bar{e}_1) + F(\bar{e}_2) = \bar{e}_1 + 2\bar{e}_2 \end{cases}$$

$$\begin{cases} F(\bar{e}_1) = \bar{e}_2 \\ F(\bar{e}_2) = \bar{e}_1 \end{cases} \qquad A_e = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$

Antag $\bar{f}_1 = \underline{e}\begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$ $\quad F(\bar{f}_1) = \bar{f}_1 \Leftrightarrow \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$

$\Leftrightarrow x_1 = x_2$ t.ex $\begin{pmatrix} 1 \\ 1 \end{pmatrix}$

$\bar{f}_1 = \underline{e}\begin{pmatrix} 1 \\ 1 \end{pmatrix}$

$\bar{f}_2 = \underline{e}\begin{pmatrix} y_1 \\ y_2 \end{pmatrix}$ $\quad F(\bar{f}_2) = -\bar{f}_2 \Leftrightarrow \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} -x_1 \\ -x_2 \end{pmatrix}$

$\Leftrightarrow x_1 = -x_2$
t.ex $\begin{pmatrix} 1 \\ -1 \end{pmatrix}$

$\bar{f}_2 = \underline{e}\begin{pmatrix} 1 \\ -1 \end{pmatrix}$

$$A_f = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$