7.3

4) $h(e_1) = h\left(\begin{pmatrix}1\\0\end{pmatrix}\right) = \begin{pmatrix}2\cdot 1 - 0\\1\end{pmatrix} = \begin{pmatrix}2\\1\end{pmatrix}$

$h(e_2) = h\left(\begin{pmatrix}0\\1\end{pmatrix}\right) = \begin{pmatrix}2\cdot 0 - 1\\0\end{pmatrix} = \begin{pmatrix}-1\\0\end{pmatrix}$

$\mathrm{A} = \begin{pmatrix}2 & -1\\1 & 0\end{pmatrix}$

6) $h(e_1) = h\left(\begin{pmatrix}1\\0\end{pmatrix}\right) = \begin{pmatrix}1 - 0\\0\end{pmatrix} = \begin{pmatrix}1\\0\end{pmatrix}$

$h(e_2) = h\left(\begin{pmatrix}0\\1\end{pmatrix}\right) = \begin{pmatrix}0 - 1\\0\end{pmatrix} = \begin{pmatrix}-1\\0\end{pmatrix}$

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

8) $h(e_1) = h\left(\begin{pmatrix}1\\0\end{pmatrix}\right) = \begin{pmatrix}1\\0\\1 - 0\end{pmatrix} = \begin{pmatrix}1\\0\\1\end{pmatrix}$

$h(e_2) = h\left(\begin{pmatrix}0\\1\end{pmatrix}\right) = \begin{pmatrix}0\\1\\0 - 1\end{pmatrix} = \begin{pmatrix}0\\1\\-1\end{pmatrix}$

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

9) $h(e_1) = h\left(\begin{pmatrix}1\\0\\0\end{pmatrix}\right) = \begin{pmatrix}1\\0\end{pmatrix}$

$h(e_2) = h\left(\begin{pmatrix}0\\1\\0\end{pmatrix}\right) = \begin{pmatrix}0\\1\end{pmatrix}$

$h(e_3) = h\left(\begin{pmatrix}0\\0\\1\end{pmatrix}\right) = \begin{pmatrix}0\\0\end{pmatrix}$

$\mathrm{A} = \begin{pmatrix}1 & 0 & 0\\0 & 1 & 0\end{pmatrix}$

10) $h(e_1) = h\left(\begin{pmatrix}1\\0\\0\end{pmatrix}\right) = \begin{pmatrix}1+2\cdot 0\\0-2\cdot 0\end{pmatrix} = \begin{pmatrix}1\\0\end{pmatrix}$

$h(e_2) = h\left(\begin{pmatrix}0\\1\\0\end{pmatrix}\right) = \begin{pmatrix}0+2\cdot 1\\0-2\cdot 1\end{pmatrix} = \begin{pmatrix}2\\-2\end{pmatrix}$

$h(e_3) = h\left(\begin{pmatrix}0\\0\\1\end{pmatrix}\right) = \begin{pmatrix}0+2\cdot 0\\1-2\cdot 0\end{pmatrix} = \begin{pmatrix}0\\1\end{pmatrix}$

$\mathrm{A} = \begin{pmatrix}1 & 2 & 0\\0 & -2 & 1\end{pmatrix}$

11) $h(e_1) = h\left(\begin{pmatrix}1\\0\\0\end{pmatrix}\right) = \begin{pmatrix}0\\0\\1\end{pmatrix}$

$h(e_2) = h\left(\begin{pmatrix}0\\1\\0\end{pmatrix}\right) = \begin{pmatrix}0\\1\\0\end{pmatrix}$

$h(e_3) = h\left(\begin{pmatrix}0\\0\\1\end{pmatrix}\right) = \begin{pmatrix}1\\0\\0\end{pmatrix}$

$\mathrm{A} = \begin{pmatrix}0 & 0 & 1\\0 & 1 & 0\\1 & 0 & 0\end{pmatrix}$

12) $h(e_1) = h\left(\begin{pmatrix}1\\0\\0\end{pmatrix}\right) = \begin{pmatrix}0\\1\\2\end{pmatrix}$

$h(e_2) = h\left(\begin{pmatrix}0\\1\\0\end{pmatrix}\right) = \begin{pmatrix}0\\0\\0\end{pmatrix}$

$h(e_3) = h\left(\begin{pmatrix}0\\0\\1\end{pmatrix}\right) = \begin{pmatrix}0\\0\\0\end{pmatrix}$

$\mathrm{A} = \begin{pmatrix}0 & 0 & 0\\1 & 0 & 0\\2 & 0 & 0\end{pmatrix}$

14) $h(e_1) = h\left(\begin{pmatrix}1\\0\end{pmatrix}\right) = \begin{pmatrix}1-0\\0-1\end{pmatrix} = \begin{pmatrix}1\\-1\end{pmatrix}$

$h(e_2) = h\left(\begin{pmatrix}0\\1\end{pmatrix}\right) = \begin{pmatrix}0-1\\1-0\end{pmatrix} = \begin{pmatrix}-1\\1\end{pmatrix}$

$\mathrm{A} = \begin{pmatrix}1 & -1\\-1 & 1\end{pmatrix}$

16) $h(e_1) = h\left(\begin{pmatrix}1\\0\\0\end{pmatrix}\right) = \begin{pmatrix}1-0\\2\cdot 0-2\cdot 1\end{pmatrix} = \begin{pmatrix}1\\-2\end{pmatrix}$

$h(e_2) = h\left(\begin{pmatrix}0\\1\\0\end{pmatrix}\right) = \begin{pmatrix}0-0\\2\cdot 0-2\cdot 0\end{pmatrix} = \begin{pmatrix}0\\0\end{pmatrix}$

$h(e_3) = h\left(\begin{pmatrix}0\\0\\1\end{pmatrix}\right) = \begin{pmatrix}0-1\\2\cdot 1-2\cdot 0\end{pmatrix} = \begin{pmatrix}-1\\2\end{pmatrix}$

$\mathrm{A} = \begin{pmatrix}1 & 0 & -1\\-2 & 0 & 2\end{pmatrix}$