3.3 1) $f\left(\begin{pmatrix}1\\1\end{pmatrix}\right) = f\left(1\begin{pmatrix}1\\0\end{pmatrix} + 1\begin{pmatrix}0\\1\end{pmatrix}\right) = 1\,f\left(\begin{pmatrix}1\\0\end{pmatrix}\right) + 1\,f\left(\begin{pmatrix}0\\1\end{pmatrix}\right)$

$$= 1\begin{pmatrix}1\\0\\-1\end{pmatrix} + 1\begin{pmatrix}2\\1\\0\end{pmatrix} = \begin{pmatrix}3\\1\\-1\end{pmatrix}$$

2) $f\left(\begin{pmatrix}2\\-1\end{pmatrix}\right) = f\left(2\begin{pmatrix}1\\0\end{pmatrix} - 1\begin{pmatrix}0\\1\end{pmatrix}\right) = 2\,f\left(\begin{pmatrix}1\\0\end{pmatrix}\right) - 1\,f\left(\begin{pmatrix}0\\1\end{pmatrix}\right)$

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

3) $f\left(\begin{pmatrix}3\\2\end{pmatrix}\right) = f\left(3\begin{pmatrix}1\\0\end{pmatrix} + 2\begin{pmatrix}0\\1\end{pmatrix}\right) = 3\,f\left(\begin{pmatrix}1\\0\end{pmatrix}\right) + 2\,f\left(\begin{pmatrix}0\\1\end{pmatrix}\right)$

$$= 3\begin{pmatrix}1\\0\\-1\end{pmatrix} + 2\begin{pmatrix}2\\1\\0\end{pmatrix} = \begin{pmatrix}7\\2\\-3\end{pmatrix}$$