Solution (#957) Note

$$\mathbf{v}_n = \begin{pmatrix} 5 & -6 \\ 1 & 0 \end{pmatrix} \mathbf{v}_{n-1} = \begin{pmatrix} 5 & -6 \\ 1 & 0 \end{pmatrix}^n \mathbf{v}_0.$$

In due course we find

$$x_n = (3^n - 2^n)x_1 + 6(2^{n-1} - 3^{n-1})x_0.$$