Solution (#783) Note

$$(A_1)^n \begin{pmatrix} 4 \\ -3 \end{pmatrix} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}.$$

and

$$A_1 \begin{pmatrix} 1 \\ 1 \end{pmatrix} = \begin{pmatrix} 1 \\ 1 \end{pmatrix} + \frac{2}{5} \begin{pmatrix} 4 \\ -3 \end{pmatrix}, \qquad (A_1)^n \begin{pmatrix} 1 \\ 1 \end{pmatrix} = \frac{1}{5} \begin{pmatrix} 5 + 8n \\ 5 - 6n \end{pmatrix}.$$

So

$$(A_1)^n \begin{pmatrix} 4 & 1 \\ -3 & 1 \end{pmatrix} = \frac{1}{5} \begin{pmatrix} 20 & 5 + 8n \\ -15 & 5 - 6n \end{pmatrix}$$

and

$$(A_1)^n = \frac{1}{35} \begin{pmatrix} 35 + 24n & 32n \\ -18n & 35 - 24n \end{pmatrix}.$$