Solution (#617) Show by induction that the nth power of

$$A^{-1} = \frac{1}{9} \begin{pmatrix} 1 & 1 \\ -4 & 5 \end{pmatrix}$$

is

$$\left(A^{-1}\right)^n = 3^{-n-1} \begin{pmatrix} 3 - 2n & n \\ -4n & 3 + 2n \end{pmatrix}$$

where $n \geqslant 1$ and that this is the inverse of A^n found in #597.