Worksheet 1/31/2025

1) Let
$$A = \begin{bmatrix} 3 & 2 \\ -2 & 1 \end{bmatrix}$$
, $B = \begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 3 & 1 \\ -2 & 2 & 0 \end{bmatrix}$
Compute A^2 , $(2A - I_2)^2$, AC , CA , CB .

2) Find all stationary vectors of the matrix $A = \begin{bmatrix} 1/2 & 1/3 & 1/4 \\ 1/2 & 1/3 & 1/2 \\ 0 & 1/3 & 1/4 \end{bmatrix}$. Does A have a probability stationary vector?