$$A = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

(1). Find eigenvalues of A.
(2). Find eigenvectors of A.
(3). Find $A^3 - A^2 - A + I$.
(4). Find C and D, such that $AC = CD$.
(5). Find e^A.
(6). Find A^{100}.
(7). Find $sin(A)$.
(8). Find $A^{1/2}$.
(9). Find rank of A.
(10). Find nullity of A.
(11). Is A singular ?

$$A = \begin{bmatrix} 5 & 4 & 3 \\ -1 & 0 & -3 \\ 1 & -2 & 1 \end{bmatrix}$$

(1). Find eigenvalues of A.
(2). Find eigenvectors of A.
(3). Find C and D, such that $AC = CD$.

$$A = \begin{bmatrix} -2 & 0 & 0 \\ 0 & 4 & 1 \\ 0 & 0 & 4 \end{bmatrix}$$

(1). Find eigenvalues of A.
(2). Find eigenvectors of A.
(3). Find C and D, such that $AC = CD$.
(4). Find A^{100}.