MECH 6300 HW2

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

$|A| = 4(-2-0) - 3(2+6) + 1(0+3)$

$-8 \quad -24 \quad +3$

$|A| = -29 \neq 0$

Full Rank

$\rho[A] = 3$

$\gamma[A] = 0$

b) $B = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 1 & 1 & 0 \end{bmatrix}$

Independent...

Dependent...

$\rho[B] = 2$

$\gamma[B] = 1$

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

Full Rank

$\rho(C) = 3$

$\rho(C) + \gamma(C) = 5$

$\gamma(C) = 2$