MECH 6300 Hw2

1)

a)

$$\left(\begin{matrix}1\\1\\1\end{matrix}\right), \left(\begin{matrix}1\\3\\2\end{matrix}\right), \left(\begin{matrix}1\\-4\\1\end{matrix}\right)$$

$$\begin{vmatrix}1 & 1 & 1\\1 & 3 & -4\\1 & 2 & 1\end{vmatrix} = \begin{array}{l}1(3 - {}^-8)\\ -1(1 - {}^-5) = 11 - 5 - 1\\ +1(2 - 3) = 5 \neq 0\end{array}$$

Full Rank $=$

Linearly Independent

b) $\left(\begin{matrix}2+j\\4+j3\end{matrix}\right), \left(\begin{matrix}-1-j\\2-j\end{matrix}\right), \left(\begin{matrix}j\\-1+j5\end{matrix}\right)$

$(2+j)(2-j) - (-1-j)(4+j3)$

$(4+1) - (-4 - j3 - j4 + 3)$

$5 - (-1 - j7) = 4 + j7 \neq 0$

Full Rank

Linearly Independent

since the first 2 define a basis in $\mathbb{C}^2$, this is dependent on the first 2...