

QUIZ 5 - LYELL READ - ~~4/30/2019~~ 4/30/2019 →

$$x_1 = \begin{pmatrix} 1 \\ -1 \\ 2 \end{pmatrix} \quad x_2 = \begin{pmatrix} 3 \\ 0 \\ -1 \end{pmatrix} \quad x_3 = \begin{pmatrix} 9 \\ 3 \\ 4 \end{pmatrix} \quad \text{are they lin. indep?}$$

$$c_1 x_1 + c_2 x_2 + c_3 x_3 = 0$$

ad-bc

$$\begin{pmatrix} 1 & 3 & 9 \\ -1 & 0 & -3 \\ 2 & -1 & 4 \end{pmatrix} \xrightarrow{\textcircled{1} + 3(\textcircled{3})} \begin{pmatrix} 7 & 0 & 21 \\ -1 & 0 & -3 \\ 2 & -1 & 4 \end{pmatrix} \cdot$$

$$= -\det \begin{pmatrix} 7 & 21 \\ -1 & -3 \end{pmatrix} - 21 + 21 = 0$$

$$\det \begin{pmatrix} 7 & 0 & 21 \\ -1 & 0 & -3 \\ 2 & -1 & 4 \end{pmatrix} = -\det \begin{pmatrix} 7 & 21 \\ 2 & 4 \end{pmatrix} \neq 0$$

~~is invertible~~

$$\begin{pmatrix} 1 & 3 & 9 \\ -1 & 0 & -3 \\ 2 & -1 & 4 \end{pmatrix} \begin{pmatrix} c_1 \\ c_2 \\ c_3 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} \leftarrow \text{NOT INVERTIBLE}$$

NOT linearly Independent \equiv linearly dependent,

as only solution is $\begin{pmatrix} c_1 \\ c_2 \\ c_3 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$.