

6.2 For $Ax_1 = e_1$ & $Ax_2 = e_2 \dots$

$$\dots x_1 = \begin{bmatrix} \frac{1}{a} \left(1 - \frac{1}{ad-bc} \right) \\ \frac{cb}{ad-bc} \end{bmatrix}, x_2 = \begin{bmatrix} -\frac{b}{ad-bc} \\ \frac{1}{d - \frac{cb}{a}} \end{bmatrix}$$

IF $\text{DET}(A) = 0$ THEN $ad-bc = 0$,
AND A^{-1} CONTAINS TERMS DIVIDED BY
 $ad-bc$, SO A^{-1} CANNOT EXIST
IF $\text{DET}(A) = 0$, ... FOR A^{-1} TO EXIST
 $\text{DET}(A) \neq 0$