4/16/2019 Quiz Wk 3 Lyell Read 933609535

$A = \begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 2 \\ 1 & 2 & 3 \end{pmatrix}$ find A^{-1}

$$\left(\begin{array}{ccc|ccc} 1 & 1 & 1 & 1 & 0 & 0 \\ 1 & 2 & 2 & 0 & 1 & 0 \\ 1 & 2 & 3 & 0 & 0 & 1 \end{array}\right) \xrightarrow{(①\cdot 2)-②} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & -1 & 0 \\ 1 & 2 & 2 & 0 & 1 & 0 \\ 1 & 2 & 3 & 0 & 0 & 1 \end{array}\right)$$

$$\xrightarrow{②-①} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & -1 & 0 \\ 0 & 2 & 2 & -2 & 0 & 0 \\ 1 & 2 & 3 & 0 & 0 & 1 \end{array}\right) \xrightarrow{2\cdot\frac{3}{2}} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & -1 & 0 \\ 0 & 3 & 3 & 0 & \frac{3}{2} & 0 \\ 1 & 2 & 3 & 0 & 0 & 1 \end{array}\right)$$

$$\xrightarrow{②-③} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & -1 & 0 \\ 0 & 1 & 0 & 0 & \frac{3}{2} & -1 \\ 1 & 2 & 3 & 0 & 0 & 1 \end{array}\right) \xrightarrow{②+①} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & -1 & 0 \\ 0 & 1 & 0 & 2 & \frac{1}{2} & -1 \\ 1 & 2 & 3 & 0 & 0 & 1 \end{array}\right)$$

$$\xrightarrow{③-①} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & -1 & 0 \\ 0 & 1 & 0 & 2 & \frac{1}{2} & -1 \\ 0 & 2 & 3 & -2 & 1 & 1 \end{array}\right) \xrightarrow{③-2\cdot②} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & -1 & 0 \\ 0 & 1 & 0 & 2 & \frac{1}{2} & -1 \\ 0 & 0 & 3 & -6 & 0 & 3 \end{array}\right)$$

4 1 -2

$$\xrightarrow{③/3} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & -1 & 0 \\ 0 & 1 & 0 & 2 & \frac{1}{2} & -1 \\ 0 & 0 & 1 & -2 & 0 & 1 \end{array}\right)$$

$$\therefore \boxed{A^{-1} = \begin{pmatrix} 2 & -1 & 0 \\ 2 & \frac{1}{2} & -1 \\ -2 & 0 & 1 \end{pmatrix}}$$

-1 2 -1

0 -1