

1) Use aug. matrix to solve

$$x + y + z = 1$$

$$x + 2y + 2z = 1$$

$$x + 2y + 3z = 1$$

1] Put into augmented matrix format

$$\underbrace{\begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 2 & 1 \\ 1 & 2 & 3 & 1 \end{pmatrix}}_{\text{AUGMENTED MATRIX}} \xrightarrow{\textcircled{1} = \textcircled{1} - (\textcircled{2}/2)} \begin{pmatrix} \frac{1}{2} & 0 & 0 & \frac{1}{2} \\ 1 & 2 & 2 & 1 \\ 1 & 2 & 3 & 1 \end{pmatrix}$$

$$\xrightarrow{\textcircled{1} \cdot 2} \begin{pmatrix} 1 & 0 & 0 & 1 \\ 1 & 2 & 2 & 1 \\ 1 & 2 & 3 & 1 \end{pmatrix} \xrightarrow{\textcircled{2} = \textcircled{2} - \textcircled{3}} \begin{pmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & -1 & 0 \\ 1 & 2 & 3 & 1 \end{pmatrix}$$

$$\xrightarrow{\textcircled{2} \cdot -1} \begin{pmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 1 & 2 & 3 & 1 \end{pmatrix} \xrightarrow{\textcircled{3} = \textcircled{3} - 3(\textcircled{2})} \begin{pmatrix} x & y & z & w \\ 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 1 & 2 & 0 & 1 \end{pmatrix}$$

$$\xrightarrow{\begin{matrix} x = 1 \\ z = 0 \\ x + 2y = 1 \end{matrix}} \rightarrow y = 0$$

$$= \begin{bmatrix} x = 1 \\ z = 0 \\ y = 0 \end{bmatrix}$$

