

ex) G.J. (naive)

elimination (Add pivoting for ps3-4)

$$\text{step } \begin{array}{cccc|c} 1 & 1 & -1 & -3 & \text{---} \textcircled{1} \end{array}$$

$$\begin{array}{cccc|c} 6 & 2 & 2 & 2 & \text{---} \textcircled{2} \end{array}$$

$$\begin{array}{cccc|c} -3 & 4 & 1 & 1 & \text{---} \textcircled{3} \end{array}$$

$$\textcircled{2} - \frac{6}{1} \times \textcircled{1}, \textcircled{3} - \frac{-3}{1} \times \textcircled{1}$$

$$\begin{array}{cccc|c} 1 & 1 & -1 & -3 & \text{---} \textcircled{4} \end{array}$$

$$\begin{array}{cccc|c} 0 & -4 & 8 & 20 & \text{---} \textcircled{5} \end{array}$$

$$\begin{array}{cccc|c} 0 & 7 & -2 & -8 & \text{---} \textcircled{6} \end{array}$$

$$\textcircled{4} - \frac{-4}{-4} \times \textcircled{5}, \textcircled{6} - \frac{7}{-4} \times \textcircled{5}$$

new!

$$\begin{array}{cccc|c} 1 & 0 & 1 & 2 & \text{---} \textcircled{7} \end{array}$$

$$\begin{array}{cccc|c} 0 & -4 & 8 & 20 & \text{---} \textcircled{8} \end{array}$$

$$\begin{array}{cccc|c} 0 & 0 & 12 & 27 & \text{---} \textcircled{9} \end{array}$$

$$\textcircled{7} - \frac{1}{12} \times \textcircled{9}, \textcircled{8} - \frac{8}{12} \times \textcircled{9}$$

new! new!

$$\begin{array}{cccc|c} 1 & 0 & 0 & -\frac{1}{4} & \text{---} \textcircled{10} \end{array}$$

$$\begin{array}{cccc|c} 0 & -4 & 0 & 2 & \text{---} \textcircled{11} \end{array}$$

$$\begin{array}{cccc|c} 0 & 0 & 12 & 27 & \text{---} \textcircled{12} \end{array}$$

$$-1 + \frac{1}{4} \cdot 8^2$$

$$-3 + \frac{1}{4} \cdot 20^2$$

$$2 - \frac{27^2}{12} = -\frac{1}{4}$$

$$20 - \frac{28^2}{12} = 2$$

back-substitution

from $\textcircled{12}$

$$12x_3 = 27$$

$$x_3 = \frac{27}{12} = 2.25 //$$

from $\textcircled{11}$

$$-4x_2 = 2$$

from $\textcircled{10}$ $x_2 = -0.5 //$

$$x_1 = -0.25 //$$