



$$\textcircled{1} \begin{bmatrix} 0.9x_1 & 0.7x_2 & 0.4x_3 & | & 0.6 \\ 0.1x_1 & 0.3x_2 & 0.6x_3 & | & 0.4 \end{bmatrix}$$

$$10R_1 \Rightarrow \begin{bmatrix} 9x_1 & 7x_2 & 4x_3 & | & 6 \\ 1x_1 & 3x_2 & 6x_3 & | & 4 \end{bmatrix}$$

$$\frac{R_1}{9} \Rightarrow \begin{bmatrix} x_1 & \frac{7}{9}x_2 & \frac{4}{9}x_3 & | & \frac{2}{3} \\ 1x_1 & 3x_2 & 6x_3 & | & 4 \end{bmatrix}$$

$$-R_1 \times R_2 \Rightarrow \begin{bmatrix} x_1 & \frac{7}{9}x_2 & \frac{4}{9}x_3 & | & \frac{2}{3} \\ 0 & \frac{20}{9}x_2 & \frac{50}{9}x_3 & | & \frac{10}{3} \end{bmatrix}$$

$$\frac{9}{20}R_2 \Rightarrow \begin{bmatrix} x_1 & x_2 & \frac{4}{5}x_3 & | & \frac{2}{3} \\ 0 & x_2 & \frac{5}{2}x_3 & | & \frac{3}{2} \end{bmatrix}$$

$$-\frac{1}{5}R_2 \times R_1 \Rightarrow \begin{bmatrix} x_1 & 0 & -\frac{3}{2}x_3 & | & -\frac{1}{2} \\ 0 & x_2 & \frac{5}{2}x_3 & | & \frac{3}{2} \end{bmatrix}$$

$$x_1 - \frac{3}{2}x_3 = -\frac{1}{2}$$

$$x_2 + \frac{5}{2}x_3 = \frac{3}{2}$$

$$\boxed{\begin{aligned} x_1 &= \frac{3}{2}x_3 - \frac{1}{2} \\ x_2 &= -\frac{5}{2}x_3 + \frac{3}{2} \\ x_3 &= x_3 \end{aligned}}$$

$$\begin{aligned} \frac{3}{2}x_3 &\geq \frac{1}{2} \quad (x_1) \\ x_3 &\geq \frac{1}{3} \\ -\frac{5}{2}x_3 &\leq \frac{3}{2} \quad (x_2) \\ x_3 &\leq \frac{3}{5} \\ \text{Range } \frac{1}{3} &\leq x_3 \leq \frac{3}{5} \end{aligned}$$

$$x_3 = \frac{1}{2}, x_1 = \frac{3}{2}(\frac{1}{2}) - \frac{1}{2}, x_2 = -\frac{5}{2}(\frac{1}{2}) + \frac{3}{2}$$

$$\boxed{x_3 = \frac{1}{2}, x_1 = \frac{1}{4}, x_2 = \frac{1}{4}}$$

Infinite solutions.  $\uparrow$  one possibility is here

②

$$\frac{D}{\$10}$$

$$\frac{S}{\$60}$$

$$\frac{E}{\$4}$$

Negative slope  
plug in largest  
 $x_3$  value.

$$10x_1 + 6x_2 + 4x_3$$

$$10\left(\frac{3}{2}x_3 - \frac{1}{2}\right) + 6\left(-\frac{5}{2}x_3 + \frac{3}{2}\right) + 4x_3$$

$$x_3 = \frac{3}{5}$$

$$15x_3 - 5 - 20x_3 + 12 + 4x_3$$

$$15\left(\frac{3}{5}\right) - 5 - 20\left(\frac{3}{5}\right) + 12 + 4\left(\frac{3}{5}\right) = \$6.40$$

Pound

③

$$x_3 = \frac{1}{3}$$

Positive slope  
plug in min  $x_3$  values

$$\frac{D}{\$10}$$

$$\frac{S}{\$6}$$

$$\frac{E}{\$4}$$

$$10\left(\frac{3}{2}x_3 - \frac{1}{2}\right) + 6\left(-\frac{5}{2}x_3 + \frac{3}{2}\right) + 4x_3$$

$$10\left(\frac{3}{2}\left(\frac{1}{3}\right) - \frac{1}{2}\right) + 6\left(-\frac{5}{2}\left(\frac{1}{3}\right) + \frac{3}{2}\right) + 4\left(\frac{1}{3}\right) = \$5.33$$

Pound