1. 
\[
\begin{pmatrix}
4 & 0 & -3 \\
0 & 1 & 5 \\
1 & 1 & 1
\end{pmatrix}
\begin{pmatrix}
\Delta x_1 \\
\Delta x_2 \\
\Delta x_3
\end{pmatrix}
= 
\begin{pmatrix}
5 \\
8 \\
6
\end{pmatrix}
\Rightarrow 
\begin{pmatrix}
4 & 0 & -3 & 5 \\
0 & 1 & 5 & 8 \\
1 & 1 & 1 & 6
\end{pmatrix}
\Rightarrow 
R_1 \leftrightarrow R_3 \
\begin{pmatrix}
4 & 0 & -3 & 5 \\
0 & 1 & 5 & 8 \\
1 & 1 & 1 & 6
\end{pmatrix}
\Rightarrow 
R_3 - 4R_1 \Rightarrow 
\begin{pmatrix}
0 & 1 & 5 & 8 \\
0 & 0 & -4 & -7 \\
0 & 1 & 5 & 8
\end{pmatrix}
\Rightarrow 
R_3 + 4R_2 \Rightarrow 
\begin{pmatrix}
1 & 1 & 1 & 6 \\
0 & 1 & 5 & 8 \\
0 & 0 & 1 & 1
\end{pmatrix}
\] 

i. \( x_3 = 1 \)
ii. \( x_2 = 3 \)
iii. \( x_1 = 2 \)

b. \[
\begin{pmatrix}
1 & a & -2 \\
2 & -2 & 3
\end{pmatrix}
\Rightarrow 
R_2 - 2R_1 \Rightarrow 
\begin{pmatrix}
1 & a & -2 \\
0 & -2 - 2a & 7
\end{pmatrix}
\]

i. \( x_2 = \frac{7}{2(a+1)} \)
ii. \( x_1 = -2 + \frac{7a}{2(a+1)} \)

2. \[
\begin{pmatrix}
4a + 2b + a = 2.5 \\
a + b + 0o = 0.75 \\
2b + 2o = 0.5
\end{pmatrix}
\Rightarrow 
\begin{pmatrix}
4 & 2 & 1 & 2.5 \\
1 & 1 & 0 & 0.75 \\
0 & 2 & 2 & 0.5
\end{pmatrix}
\Rightarrow 
R_1 \leftrightarrow R_2 \Rightarrow 
\begin{pmatrix}
1 & 1 & 0 & 0.75 \\
0 & 2 & 2 & 0.5
\end{pmatrix}
\Rightarrow 
(R_2 + R_3) / 3 \Rightarrow 
\begin{pmatrix}
0 & 0 & 1 & 0 \\
0 & 2 & 2 & 0.5
\end{pmatrix}
\Rightarrow 
R_2 \leftrightarrow \frac{R_3}{2} \Rightarrow 
\begin{pmatrix}
1 & 1 & 0 & 0.75 \\
0 & 1 & 1 & 0.25
\end{pmatrix}
\]

a. Apples are free ($0)
b. Bananas are $0.25
c. Oranges are $0.50

3. \[
\begin{pmatrix}
1 & 0 & 1 & 0 \\
1 & 1 & 0 & 0 \\
1 & 1 & 1 & 1 \\
1 & 0 & 0 & 1
\end{pmatrix}
\begin{pmatrix}
\Delta x_1 \\
\Delta x_2 \\
\Delta x_3 \\
\Delta x_3
\end{pmatrix}
= 
\begin{pmatrix}
0.63 \\
1.25 \\
2.78 \\
1.44
\end{pmatrix}
\Rightarrow 
R_2 - R_1 \Rightarrow R_3 - R_1 \Rightarrow R_4 - R_1 \Rightarrow R_3 - R_2 \Rightarrow R_1 -
\begin{pmatrix}
1 & 0 & 0 & 0.27 \\
0 & 1 & 0 & 0.98 \\
0 & 0 & 1 & 0.36 \\
0 & 0 & 0 & 1.17
\end{pmatrix}
\] 

a. \( x_1 = 0.27 \)
b. \( x_2 = 0.98 \)
c. \( x_3 = 0.36 \)
d. \( x_4 = 1.17 \)