1. A biologist wants to monitor the activity of three species of mollusk in an underwater cave. The biologist sets up different sensors in the cave. There is a sensor to detect arms, eyes, and shells. Individuals of species $X$ have 2 arms and 2 eyes, individuals of species $Y$ have 1 arm and 2 eyes, and individuals of species $Z$ have 1 arm and 1 eye. Every species has 1 shell. After an hour, the sensors detected 5 arms, 7 eyes, and 4 shells. How many individuals of each species were detected by the sensors?

\[\begin{align*}
\text{arms: } & \quad 2x + y + z = 5 \\
\text{eyes: } & \quad 2x + 2y + z = 7 \\
\text{shells: } & \quad x + y + z = 4
\end{align*}\]

\[
\begin{bmatrix}
2 & 1 & 1 & 5 \\
2 & 2 & 1 & 7 \\
1 & 1 & 1 & 4
\end{bmatrix}
\]

\[
\begin{array}{c}
\text{R}_1 - 2 \text{R}_2 \rightarrow \text{R}_3 \\
\text{R}_1 - \text{R}_2 \rightarrow \text{R}_3
\end{array}
\]

\[
\begin{bmatrix}
2 & 1 & 1 & 5 \\
0 & -1 & 0 & -2 \\
0 & 0 & -1 & -3
\end{bmatrix}
\]

\[
\begin{align*}
\chi &= \frac{1}{2} (5 - 1 - 2) = 1 \\
y &= 2 \\
z &= 1
\end{align*}
\]

\[
\begin{array}{c}
1 \text{ of species } 1 \\
2 \text{ of species } 2 \\
1 \text{ of species } 3
\end{array}
\]