1. **Problem**
   Given the following information:

$$
\begin{array}{ccccccc}
\text{banana} & + & \text{pineapple} & + & \text{pineapple} & = & 909 \\
\text{banana} & + & \text{pineapple} & + & \text{banana} & = & 516 \\
\text{pineapple} & + & \text{orange} & + & \text{pineapple} & = & 921
\end{array}
$$

Compute:

$$
\text{banana} + \text{orange} + \text{pineapple} = \ ?
$$

Solution
The information provided can be interpreted as the price for three fruit baskets with different combinations of the three fruits. This corresponds to a system of linear equations where the price of the three fruits is the vector of unknowns x:

$$
x_1 = \text{banana} \qquad x_2 = \text{orange} \qquad x_3 = \text{pineapple}
$$

The system of linear equations is then:

$$
\begin{pmatrix} 1 & 0 & 2 \\ 2 & 0 & 1 \\ 0 & 1 & 2 \end{pmatrix} \cdot \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 909 \\ 516 \\ 921 \end{pmatrix}
$$

This can be solved using any solution algorithm, e.g., elimination:

$$
x_1 = 41, \ x_2 = 53, \ x_3 = 434.
$$

Based on the three prices for the different fruits it is straightforward to compute the total price of the fourth fruit basket via:

$$
\begin{array}{ccccccc}
\text{banana} & + & \text{orange} & + & \text{pineapple} & = & \\
x_1 & + & x_2 & + & x_3 & = & \\
41 & + & 53 & + & 434 & = & 528.
\end{array}
$$