

Question

1) Let take that x plates for seniors, y plates for adults and z plates for children.

Then our variables are: x , y and z .

2) Total number of plates sold is $TN = x + y + z = 150$.

3) The total receipts: $TR = 6 \cdot x + 9 \cdot y + 0 \cdot z = 6 \cdot x + 9 \cdot y = 960$.

4) We know that twice as many adult plates were purchased as senior plates, so, the third equation can show us that the variable that represent the number of adult plates – variable y – more by two times than the variable that represent the number of senior plates – variable x . So, we have: $y = 2 \cdot x$.

5) So, we have next system of equations:

$$\begin{cases} x + y + z = 150 \\ 6 \cdot x + 9 \cdot y = 960 \\ y = 2 \cdot x \end{cases} \Rightarrow \begin{cases} x + 2 \cdot x + z = 150 \\ 6 \cdot x + 18 \cdot x = 960 \\ y = 2 \cdot x \end{cases} \Rightarrow \begin{cases} z = 150 - 3 \cdot x \\ 24 \cdot x = 960 \\ y = 2 \cdot x \end{cases} \Rightarrow$$
$$\Rightarrow \begin{cases} z = 150 - 3 \cdot 40 \\ x = 40 \\ y = 2 \cdot 40 \end{cases} \Rightarrow \begin{cases} x = 40 \\ y = 80 \\ z = 30 \end{cases}$$

So, we find that: $x = 40, y = 80, z = 30$. Then we can say that 40 senior plates, 80 adult plates and 30 children plates were purchased.

Answer: Then we can say that 40 senior plates, 80 adult plates and 30 children plates were purchased.