

Question #25528

The ratio of Luke to Oscar's money was 7 : 4 at first. After Luke saved another \$356 and Oscar saved another \$176, Luke had twice of Oscar. How much did Luke have in the end?

Solution: Assume that Luke's money equal $-x$, and Oscar's money $-y$. We can construct the following system of linear equations with two unknowns:

$$\begin{cases} \frac{x}{y} = \frac{7}{4} \\ \frac{x+356}{y+176} = 2 \end{cases} \rightarrow \begin{cases} x = \frac{7y}{4} \\ \frac{x+356}{y+176} = 2 \end{cases}$$

Substitute the value of x into the second equation:

$$\begin{aligned} \frac{\frac{7y}{4} + 356}{y+176} = 2 &\rightarrow \frac{7y+1424}{4y+704} = 2 \rightarrow 7y + 1424 = 8y + 1408 \rightarrow y = 16 \rightarrow \\ &\rightarrow x = \frac{7 \times 16}{4} \rightarrow x = 28. \end{aligned}$$

$x + 356 = 28 + 356 = 384$ - amount that Luke had at the end.

Answer: \$384.