

Word Problems with Comparison Method

1) Two hairdressers are competing for clientele. The first charges an average of \$45 per client and the other \$35. The first pays \$1000 in rent every month for her salon, and the other, \$600.

a) What do x&y represent? (In words)

x = # of clients

y = total money made (\$)

b) What linear system represents the above situation?

$$y = 45x - 1000$$

$$y = 35x - 600$$

c) How many clients do they have to have for the hairdressers to make the same income? How much do they make?

Solution:

$$y = y$$

$$45x - 1000 = 35x - 600$$

$$\frac{10x}{10} = \frac{400}{10}$$

$$\underline{\underline{x = 40}}$$

← They both need 40 clients to earn the same income.

now find y, x = 40.

$$y = 45(40) - 1000$$

$$= 800 \$$$

← Same salary of \$800.

Answer:

They both need 40 clients to have a salary of \$800.

2) Amanda borrows \$22 000 to buy a new car. She has to pay back the loan in monthly installments of \$500. At the same time, Corey buys a boat for \$15 000 and has to pay back his loan in monthly installments of \$300.

a) What do x and y represent?

$x = \#$ of months

$y =$ Amount of remaining debt (\$)

b) What linear system represents the situation?

$$y_A = 22000 - 500x$$

$$y_C = 15000 - 300x$$

c) When will they owe the **same** amount? How much will that be?

$$y_A = y_C$$

$$22000 - 500x = 15000 - 300x$$

$$7000 = 200x$$

$$x = 35 \text{ months}$$

now find y :

$$\begin{aligned} y &= 22000 - 500(35) \\ &= 4500\$ \end{aligned}$$

\therefore In 35 months they will each owe \$4500.