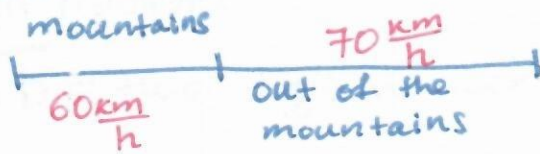


## Travel Problems

#67



Let  $x$  represent the amount of time, in hr, that Maria spent driving through the mountains;

let  $y$  rep. the time spent driving out of the mountains.

$$\begin{cases} x + y = 9 & \textcircled{1} \checkmark \\ 60x + 70y = 580 & \textcircled{2} \end{cases}$$

From  $\textcircled{1}$ :  $x = 9 - y$   $\textcircled{1}'$

Sub into  $\textcircled{2}$ :

$$60(9 - y) + 70y = 580$$

$$540 - 60y + 70y = 580$$

$$10y = 580 - 540$$

$$10y = 40, \quad y = \frac{40}{10} = 4$$

$$x = 9 - 4$$

$$x = 5 \text{ hours}$$

$\therefore$  It took Maria 5 hours to drive through the mountains.

## Digit Problems

$\overline{ab}$  = two-digit number

$$\overline{ab} = 10a + b \checkmark$$

(#82) Let  $x$  represent the tens digit.

Let  $y$  rep. the units digit; let the original number be  $\overline{xy}$

$$\boxed{x + y = 7} \quad (1)$$

$$\overline{yx} = 2 + 2\overline{xy}$$

$$10y + x = 2 + 2(10x + y)$$

$$10y + x = 2 + 20x + 2y$$

$$\boxed{8y - 19x = 2} \quad (2)$$

$$\begin{cases} x + y = 7 & (1) \\ 8y - 19x = 2 & (2) \end{cases}$$

Eliminate  $y$ :

$$(1) \times 8: 8y + 8x = 56 \quad (1')$$

$$(2): 8y - 19x = 2 \quad (2)$$

$$(1') - (2): 27x = 54, \quad x = \frac{54}{27} = 2$$

$$\text{Sub } x = 2 \text{ into } (1): 2 + y = 7, \quad y = 7 - 2 \\ y = 5$$

Answer: the original number is 25.  $\checkmark$