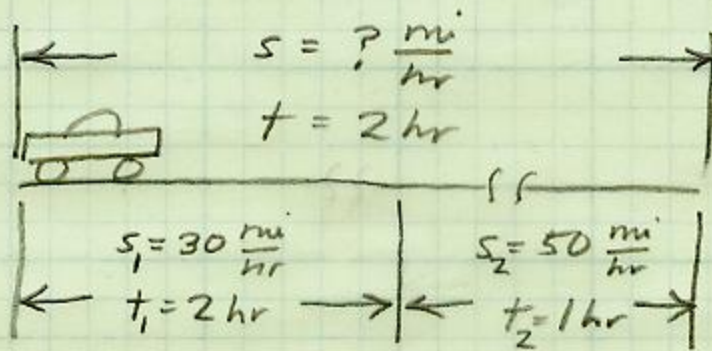


1.

Given: A car travels $30 \frac{\text{mi}}{\text{hr}}$ for 2 hours, then at $50 \frac{\text{mi}}{\text{hr}}$ for an additional hour.



Assume car makes no stops.

Find: Average speed of car to make same trip in 2 hours.

Relationships: From the basic principle that distance is equal to speed times time,

$$d = s \cdot t$$

where $d = \text{distance (mi)}$

$s = \text{speed } (\frac{\text{mi}}{\text{hr}})$

$t = \text{time (hr)}$

Solving for speed,

$$\frac{d}{t} = \frac{s \cdot t}{t}$$

$$s = \frac{d}{t}$$

Solution:

The total distance traveled is given by

$$d = d_1 + d_2 = s_1 \cdot t_1 + s_2 \cdot t_2$$

$$d = 30 \frac{\text{mi}}{\text{hr}} \cdot 2 \text{ hr} + 50 \frac{\text{mi}}{\text{hr}} \cdot 1 \text{ hr}$$

$$d = 60 \text{ mi} + 50 \text{ mi}$$

$$d = 110 \text{ mi}$$

$$s = \frac{d}{t} = \frac{110 \text{ mi}}{2 \text{ hr}}$$

$$s = \underline{\underline{55 \frac{\text{mi}}{\text{hr}}}}, \text{ average speed}$$

Check: $d = 55 \frac{\text{mi}}{\text{hr}} \cdot 2 \text{ hr} = 110 \text{ mi} \checkmark$
OK