

## Answer on Question 69128, Physics, Mechanics | Relativity

### Question:

A car travels in a straight line with an average velocity of  $80 \text{ km/h}$  for  $2.5 \text{ h}$  and then average velocity of  $40 \text{ km/h}$  from  $1.5 \text{ h}$ .

a) what is the total displacement for the  $4 \text{ h}$  trip?

b) what is the average velocity for the total trip?

### Solution:

a) Let's find the total displacement for the  $4 \text{ h}$  trip:

$$\begin{aligned}d_{tot} &= d_1 + d_2 = v_1 t_1 + v_2 t_2 = 80 \frac{\text{km}}{\text{h}} \cdot 2.5 \text{ h} + 40 \frac{\text{km}}{\text{h}} \cdot 1.5 \text{ h} = 260 \text{ km} = \\ &= 2.6 \cdot 10^5 \text{ m}.\end{aligned}$$

b) By the definition, the average velocity is the total distance traveled divided by the total time (the total distance travelled by the car is equal to the total displacement for the  $4 \text{ h}$  trip):

$$v_{avg} = \frac{d_{tot}}{t_{tot}} = \frac{260 \text{ km}}{4.0 \text{ h}} = 65 \frac{\text{km}}{\text{h}}.$$

### Answer:

a)  $d_{tot} = 2.6 \cdot 10^5 \text{ m}$ .

b)  $v_{avg} = 65 \frac{\text{km}}{\text{h}}$ .