

Question #54289, Physics / Mechanics | Kinematics | Dynamics |

Suppose your average speed is 22 m/s for the first 130 minutes of a 3 hour trip. If you want your average speed for the whole trip to be 18 m/s, what must be the average speed for the remaining 50 minutes of your trip?

Answer:

The average speed for 3 hours is defined:

$v = (v_1t_1 + v_2t_2)/t$, where v_1t_1 – the distance passed during the first part of trip and v_2t_2 - the distance passed during the second part of trip, t – the total time.

After substitution of all known parameters the equation becomes as follow:

$$18 \text{ m s}^{-1} = (22 \text{ m s}^{-1} \times 130 \text{ min} + v_2 \times 50 \text{ min}) / 180 \text{ min}$$

Then,

$$[(3240 - 2860)/50] \text{ m s}^{-1} = v_2$$

$$v_2 = 7.6 \text{ m s}^{-1}$$

Thus, be the average speed for the remaining 50 minutes should be 7.6 m s⁻¹.