

Question 1. *Another jogger runs northward in a straight line with an average velocity of $v_1 = 5.0 \text{ m/s}$ for $t_1 = 4.0 \text{ min}$ and then turns around and runs southward with an average velocity of $v_2 = 4.0 \text{ m/s}$ for $t_2 = 3.0 \text{ min}$. What is his average velocity v_{av} ?*

Solution. $v_i = \frac{s_i}{t_i}$, $i = 1, 2$ and $s_i = v_i t_i$, $i = 1, 2$.

$$v_{av} = \frac{s_1 + s_2}{t_1 + t_2} = \frac{v_1 t_1 + v_2 t_2}{t_1 + t_2} = \frac{5 \cdot 4 \cdot 60 + 4 \cdot 3 \cdot 60}{4 \cdot 60 + 3 \cdot 60} \approx 4.57 \text{ m/s}.$$

□