Q- In reaching her destination, a backpacker walks with an average velocity of 1.07 m/s, due west. This average velocity results, because she hikes for 5.36 km with an average velocity of 2.37 m/s due west, turns around, and hikes with an average velocity of 0.748 m/s due east. How far east did she walk (in kilometers)?
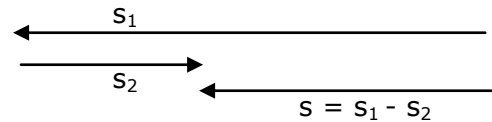
Time taken in the first hike due west will be

$$t_1 = s_1/v_1 = 5.36*10^3/2.37 = 2261.6 \text{ s} \quad --- (1)$$

Let the time for second hike be t_2

Distance covered in second hike will be given by

$$s_2 = 0.748*t_2 \qquad ----- (2)$$

Now the total time taken is $(t_1 + t_2)$

And the total displacement is $(s_1 - s_2)$

Gives the average velocity for the whole trip as

$$v = (s_1 - s_2)/ (t_1 + t_2)$$

Or $\quad v*(t_1 + t_2) = (s_1 - s_2)$

Substituting the values from equation 1 and 2 and from the question we have

$$1.07\left(2261.6 + \frac{s_2}{0.748}\right) = 5360 - s_2$$

Or $\quad 2419.9 + 1.4305 * s_2 = 5360 - s_2$

Or $\quad 1.4305 * s_2 + s_2 = 5360 - 2419.9$

Gives $\quad s_2 = 1209.7 \text{ m} = 1.21 \text{ km.}$