Question 32639

Let the total distance be L. Then particle has moved $L/2$ at velocity $v_1 = 3\,m/s$, $L/4$ at velocity $v_2 = 3.5\,\dfrac{m}{s}$ and $L/4$ at velocity $v_3 = 7.5\,\dfrac{m}{s}$.

Average velocity is $v = \dfrac{L}{t}$, where t is the time needed to cover the whole distance.

Time to travel each distance is (knowing the velocities):

$$t_1 = \frac{\dfrac{L}{2}}{v_1}\,;\, t_2 = \frac{\dfrac{L}{4}}{v_2}\,;\, t_3 = \frac{\dfrac{L}{4}}{v_3}\,.$$

Total time is $t = t_1 + t_2 + t_3$.

Therefore, average velocity is $v = \dfrac{L}{t} = \dfrac{L}{\dfrac{L}{2v_1} + \dfrac{L}{4v_2} + \dfrac{L}{4v_3}} = \dfrac{1}{\dfrac{1}{2v_1} + \dfrac{1}{4v_2} + \dfrac{1}{4v_3}} = \dfrac{90}{23}\dfrac{m}{s} \approx 3.91\,\dfrac{m}{s}$.