Question 35246

Let t_i denote time of moving through interval L_i with velocity v_i. Using this notation, $t_1=0.5\,h;\ v_1=80\frac{km}{h};\ t_2=\frac{12}{60}h;\ v_2=105\frac{km}{h};\ t_3=\frac{45}{60}h;\ v_3=40\frac{km}{h}$. Also, time spent for buying gas is $t'=\frac{21}{60}h$.

a)

The average speed is the total distance divided by time it took to cover this distance, $v=\frac{L}{t}$. In this case, time is sum of three times moving on three intervals plus time needed to buy gas: $t=t_1+t_2+t_3+t'=0.5+\frac{12}{60}+\frac{45}{60}+\frac{21}{60}=\frac{9}{5}h$. Total distance is $L=v_1t_1+v_2t_2+v_3t_3=91\,km$.

Hence, average velocity is $v=\frac{91\,km}{\frac{9}{5}h}=\frac{455}{9}\frac{km}{h}\approx 50.56\frac{km}{h}$.

b) The total distance traveled is already calculated in a):

$L=v_1t_1+v_2t_2+v_3t_3=0.5\cdot 80+\frac{12}{60}\cdot 105+\frac{45}{60}\cdot 40=91\,km$.