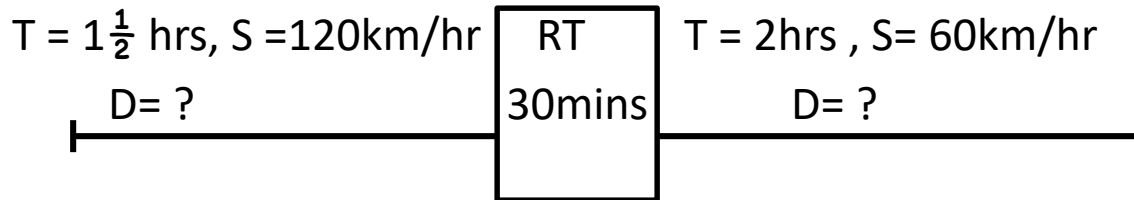# AVERAGE SPEED INVOLVING RESTING

1. A motorist travelled for $1\frac{1}{2}$ hrs at a speed of 120km/hr, after resting for 30mins. He continued for another 2 hrs at a speed of 60km/hr.

a) Find the total distance covered.

T = $1\frac{1}{2}$ hrs, S =120km/hr | RT | T = 2hrs , S= 60km/hr

D= ? | 30mins | D= ?

1st Journey	2nd Journey	TDC
D= S x T	D= S x T	180km
		+ 120km
$$D = \frac{\overset{60}{\cancel{120}}km \times \cancel{3}\ hrs}{1\ h\cancel{r} \quad \cancel{2}_1}$$	$$D = \frac{60km \times 2\cancel{hrs}}{1\cancel{hr}}$$	300km
	D = 60km x 2	
D = 60km x 3		
D = 180km	D= 120km	

b) Calculate the average speed for the entire journey

T.T.T= (1½ + ½ + 2) hrs

$$AVS = \frac{TDC}{TTT}$$

(2 + 2) hrs

 T.T.T= 4hrs

$$AVS = \frac{300km}{4hrs}$$

$$AVS = \frac{\overset{75}{\cancel{300}}km}{\underset{1}{\cancel{4}}hrs}$$

AVS = 75km/hr.

2. Loy left town A travelling at a speed of 50km/hr for 3hrs to town B. she then increased the previous speed **by 25km/hr** and took 2hrs to reach town C. Calculate the Average speed for the whole journey.

Distance A to B	Distance B to C	T.T.T	TDC
D= S x T	D= S x T	(3 +2) hrs = 5hrs	150km + 150km
D = 50km x 3 hrs / 1 hr	D = 75km x 2hrs / 1hr		300km
	D = 75km x 2		
D = 50km x 3			
D = 150km	D= 150km		

AVS= TDC
         TTT

AVS = $\dfrac{300\text{km}}{5\text{hrs}}$

AVS = $\dfrac{\overset{60}{\cancel{300}}\text{km}}{\underset{1}{\cancel{5}}\text{hrs}}$

AVS = 60km/hr

3. A bus leaves town Q for P a distance of 210km for 2 hrs. It **rested** at P for 45mins and continued to R which is 50km away from P at an average speed of 100km/hr.

a) At what speed did it travel between P and Q?

D= 210km,   D = 50km

T=2hrs   P   S =100km/hr

Q   S=?   T=?   R

|_____[RT]_____|

[RT]
45mins

Speed = $\dfrac{D}{T}$ 105
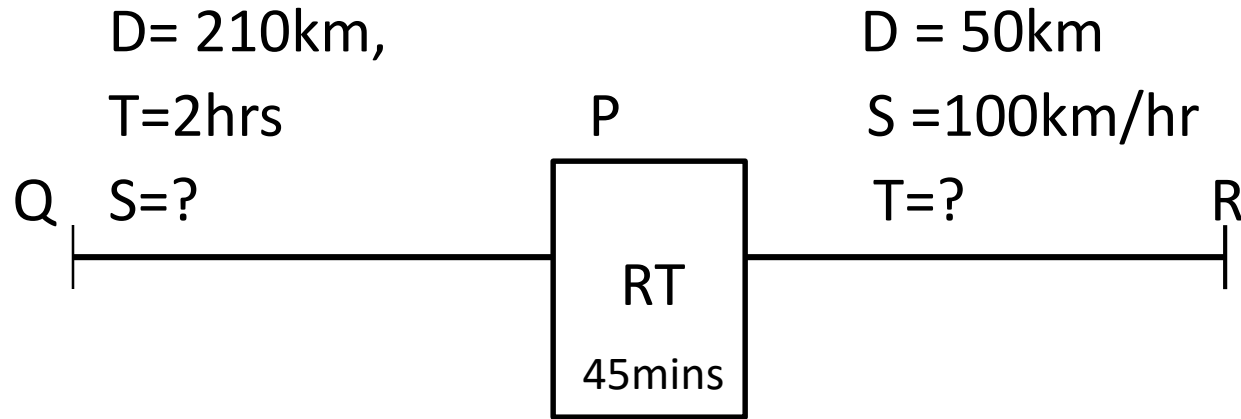
= $\dfrac{210km}{2hrs}$

= $\underline{105km/hr}$

b) Calculate the average speed for the whole journey.

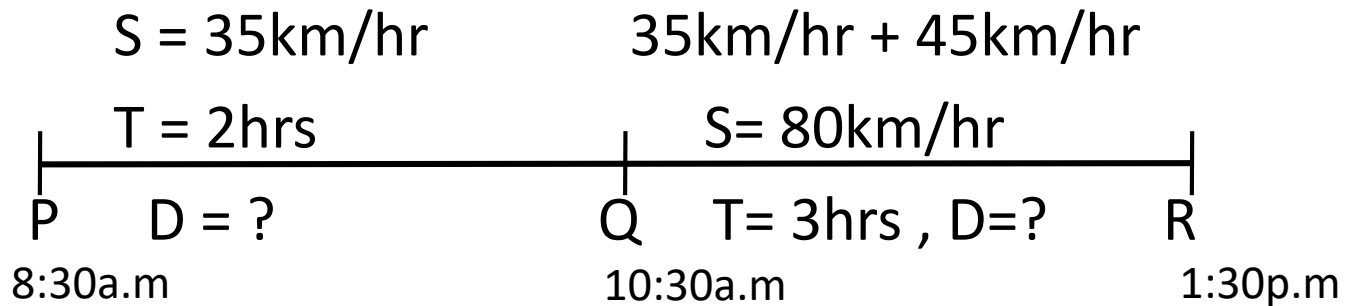| TDC	TTT	Time from P to R
210km + 50km ────── 260km ────────	(2hrs+ 30mins + 45mins) 30mins + 45mins $\quad$1 r 15 7̶5̶ 6̶0̶ 1 hr 15mins (1 + 2)hrs + $\underline{1}$ hrs $\qquad\qquad$ 4 3 hrs + $\underline{1}$ hrs $\qquad\quad$ 4 3¼ hrs.	T = $\underline{D}$ $\quad$ S T = $\cancel{5}\cancel{0}$km $\quad$ $\cancel{1}\cancel{0}\cancel{0}$km/hr $\qquad$ 2 T = ½ hr.

AVS = TDC ÷ TTT

AVS = 260km ÷ 13 hrs

$$= \overset{20}{\cancel{260}}\text{km} \times \frac{\overset{4}{4}}{\cancel{13}\underset{1}{\text{hrs}}}$$

$$= 20\text{km} \times \frac{4}{1\text{hr}}$$

$$= 80\text{km/hr.}$$

4. John travelled from P to Q at an average speed of 35km/hr from 8:30a.m to 10:30a.m, without stopping at Q, he increased his speed **by 45km/hr** and continued to R where he reached at 1:30p.m.

a) Find the total time taken from P to R.

S = 35km/hr   35km/hr + 45km/hr

T = 2hrs   S= 80km/hr

P   D = ?   Q   T= 3hrs , D=?   R

8:30a.m   10:30a.m   1:30p.m

P to Q		Q to R		2hrs + 3hrs =<u>5hrs</u>
T = AT – DT		T = A.T – D.T		
Hrs	Mins	Hrs	Mins	
10	30	13	30	
- 8	30	- 10	30	
2	00	3	00	
T= 2hrs		T = 3hrs		

b) Calculate the average speed for the whole journey.

Dist P to Q	Dist Q to R	TDC
D= S x T	D= S x T	240km
		+ 70km
$D = \dfrac{35km \times 2\,\cancel{hrs}}{1\,\cancel{hr}}$	$D = \dfrac{80km \times 3\,\cancel{hrs}}{1\,\cancel{hr}}$	310km
	D = 80km x3	
D = 35km x 2		
D = 70km	D= 240km	

$AVS = \dfrac{TDC}{TTT}$

$AVS = \dfrac{310km}{5hrs}$

$AVS = \dfrac{\overset{62}{3\cancel{10}km}}{\underset{1}{\cancel{5}hrs}}$

AVS = 62km/hr

5. John traveled from Kino to Muno at an average speed of 80km/hr for 1½ hrs, he then continued to Zino at an AVS of 160km/hr for 30 mins after resting for 1 hr,he returned to Kino using a speed of 100km/hr.
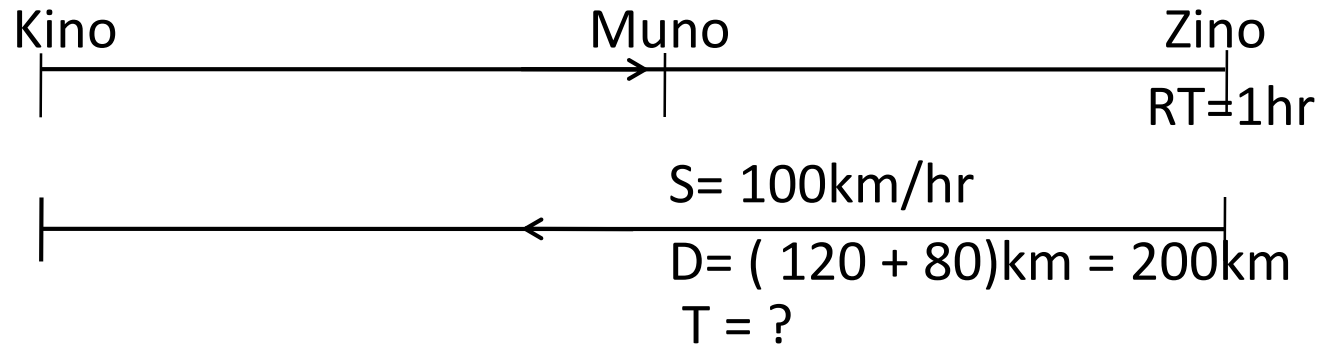
a) Find the distance from Kino to Zino.

S= 80km/hr	S = 160km/hr
T = 1 ½ hrs	T = ½ hr
D = ? 120km	D = ? 80km

Kino   Muno   Zino

RT=1hr

S= 100km/hr

D= (120 + 80)km = 200km
T = ?

Kino to Muno	Muno to Zino	TDC

Kino to Muno
D= S x T
 	
$$D = \frac{\overset{40}{\cancel{80km}}}{\underset{1}{\cancel{1hr}}} \times \frac{3 \cancel{hrs}}{\cancel{2}}$$
 	
D = 40km x 3
D = 120km
	Muno to Zino
	D= S x T
	
	$$D = \frac{\overset{80}{\cancel{160km}}}{\underset{1}{\cancel{1hr}}} \times \frac{1 \cancel{hrs}}{\cancel{2}}$$
	D = 80km
		TDC
		   120km
		+ 80km
		   200km

b) How long did he take from Muno to Zino and back to Kino?

$$T = \frac{D}{S}$$

$$T = \left(\frac{200\text{km}}{100\text{km}} \right) \text{hrs}$$

$$T = \left(\frac{200}{100} \right) \text{hrs}$$

$$T = 2\text{hrs}$$

TTT

½ hrs + 2hrs

=2 ½ hrs

Calculate the average speed for the whole journey

T T T	T D C	A V S
$(1 \frac{1}{2} + \frac{1}{2} + 1 + 2)$hrs	120km	AVS = $\frac{TDC}{TTT}$
(2 + 3) hrs	80km	
= 5hrs	+200km	AVS = $\frac{400km}{5hrs}$
	400km	
		AVS = $\frac{\overset{80}{\cancel{400}km}}{\underset{1r}{\cancel{5}hrs}}$
		AVS= 80km/hr

ACTIVITY

1. A cyclist travelled at 40km/hr for 1 ½ hrs, he rested for 30 mins and continued for 3 hrs at 80km/hr. Calculate his average speed.

2. The bus travelled from Kampala to Masaka at an AVS of 80km/hr , it broke down after 2 hrs and 30 mins drive, the repairs took 30mins and the bus continued with the journey at 50km/hr for 2hrs.

a) How far is Kampala to Masaka?

b) Calculate the average speed for the entire journey.

3. A motorist rode at a speed of 50km/hr for 2hrs before he ran out of fuel. It took him 30 mins to get fuel. He then rode at a speed of 48km/hr for 2hrs and 30 mins. Calculate his speed for the whole journey.