Speed, Distance, Time

* Unit 2 Test on Wed (March 4)

How are Speed, Distance and Time related? Hint: Think of road signs. e.g) 60 km/h

$\text{Speed} = \dfrac{\text{Distance}}{\text{Time}}$	$\text{Distance} = S \cdot T$	$\text{Time} = \dfrac{D}{S}$

$\downarrow$

$\text{Speed} = \dfrac{D}{T}$

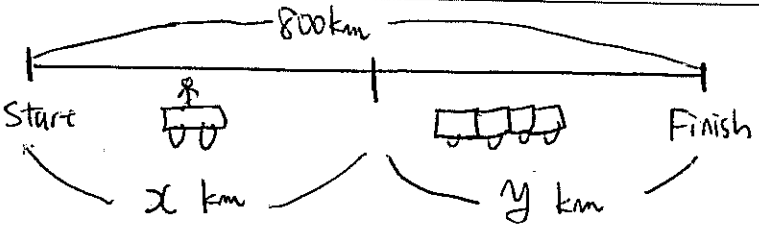
***These problems are all different!** There is **NOT** one method of solving these. You may want to draw a diagram of each situation to help you.

Example 1 Joe travels out of the country. He first rides his motorcycle at 65 km/h. After crashing he hops a train and travels at 70 km/h. If the entire trip took 12 hours and he travelled 800 km in total, how far did he travel by train?

Let x be the distance he travelled by motorcycle

Let y be the " " " " train.

	Distance	Speed	Time $\left(= \frac{D}{S}\right)$
Motocycle	x	65 km/h	$\frac{x}{65}$
Train	y	70 km/h	$\frac{y}{70}$
Total	800 km		12 hours



(A) $x + y = 800$ (Distance)

(B) $\dfrac{x}{65} + \dfrac{y}{70} = 12$ (Time)

(B) $\times 65$: $65\left(\dfrac{x}{65} + \dfrac{y}{70}\right) = 65 \times 12$

65(B): $x + \dfrac{65y}{70} = 780$

(A): $x + y = 800$

(65B) − (A) $0 + \dfrac{65y}{70} - \dfrac{70y}{70} = -20$

$\dfrac{-5y}{70} = -20$

$\dfrac{-5y}{70} \times 70 = -20 \times 70$

$\dfrac{-5y}{-5} = -\dfrac{1400}{-5}$

$y = 280$

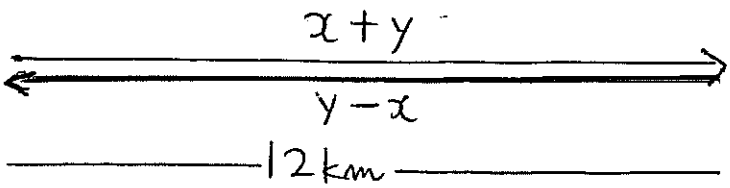
$\therefore$ He travelled 280 km by train.

Example 2 A canoeist took 2 h to travel 12 km down a river. The return trip, against the current, took 3 h. What was the speed of the current?

Let x be the speed of the current.

Let y be the speed of the canoeist.

	Distance (km)	Speed (km/h)	Time (h)
with current	12 km	$x+y = \frac{12\ km}{2\ hours}$	2 hours
against current	12 km	$y-x = \frac{12}{3}$	3 hours



Ⓐ $x+y = \frac{12\ km}{2\ hours}$

Ⓑ $y-x = \frac{12\ km}{3\ hours}$

Ⓐ $x+y = 6\ km/h$

Ⓑ $y-x = 4\ km/h$

* Rearrange Ⓐ to eliminate x

$x = 6-y$

* Sub $x=6-y$ into Ⓑ

Ⓑ $y-(6-y) = 4$

$y-6+y = 4$

$2y-6 = 4$

$2y = 4+6$

$2y = 10$

$\frac{2y}{2} = \frac{10}{2}$

$y = 5$

Sub $y=5$ into Ⓐ

Ⓐ $x+5 = 6$

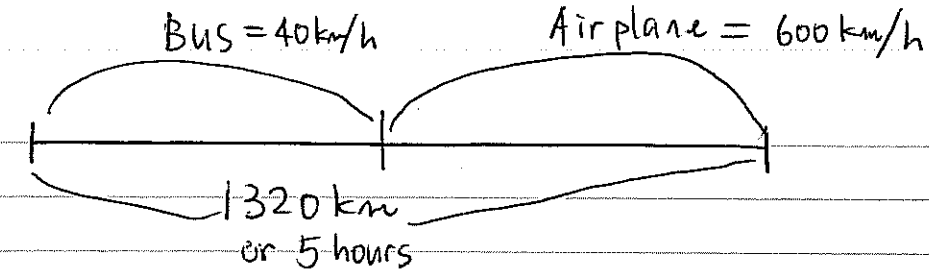
$x = 1$

$\therefore$ The speed of the current is 1 km/h

Homework: Speed/Distance/Time Worksheet

March 2 HW

#4



Time they travelled by bus $= x$

" " " " Airplane $= y$

Distance $\Rightarrow$ $1320\text{ km} = 40x + 600y$ (A)

Time $\Rightarrow$ $x + y = 5$ (B)

Rearrange (B) $x = 5 - y$

Sub $x = 5 - y$ into (A)

(A) $40(5-y) + 600y = 1320$

$200 - 40y + 600y = 1320$

$560y = 1320 - 200$

$\frac{560y}{560} = \frac{1120}{560}$

$y = 2$

sub into (B)

$x = 3$

$\therefore$ They travelled 3 hours by bus.