Speed, Density Exercise

Bill drove from A to B a distance of 86 km in 1 hr 30 min. He drove from B to C in 2 hr 20 min at a speed of 90 km/hr. He drove from C to D a distance of 100 km at 80 km/h.

Find his average speed from A to D

$$\text{Average Speed} = \frac{\text{Total Distance}}{\text{Total Time}}$$

	Speed	Time	Distance
A → B		1 hr 30 m	86 km
B → C	90 km/h	2 hr 20 m	210 km
C → D	80 km/h	1 hr 15 min	100 km
	Totals	5 hr 5 min	396 km

$$\text{Average Speed} = \frac{396}{\frac{61}{12}} = 77.9 \text{ km/hr}$$

How long in hours and minutes would be a 593 km journey travelling at 114 km/hr

$$\text{Time} = \frac{\text{Dist}}{\text{Speed}} = \frac{593}{114} = 5.20175 \text{ hrs}$$

= 5 hrs 12 min

To convert 5.20175 hrs into hours and minutes first subtract the 5 hrs on calculator to leave 0.20175 of an hour. Multiply this by 60 to turn into minutes

$0.20175 \times 60 = 12.105$ so 12 min

Answer 5 hrs 12 min

Density A compound D is made from A, B and C

50g of A is used which has density $4.2\ g/cm^3$

100g of B is used which has volume $36\ cm^3$

$85\ cm^3$ of C is used which has density $2.5\ g/cm^3$

Find the density of compound D

$$\text{Density} = \frac{\text{Total Mass}}{\text{Total Volume}}$$

	Density	Mass	Vol
A	$4.2\ g/cm^3$	50g	$11.905\ cm^3$
B		100g	$36\ cm^3$
C	$2.5\ g/cm^3$	212.5g	$85\ cm^3$

Totals	362.5 g	132.405 cm^3

$$\text{Density} = \frac{M}{V} = \frac{362.5}{132.405}$$

$$\text{Density} = 2.73\ g/cm^3$$

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