Revision - Compound Measures - Compound Interest

Speed, Time, Distance

$$D = S \times T$$

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

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

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

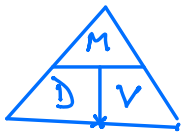
Example

John drives a distance of 100 km from A to B in 2 hours.
He then drives at 40 km/h for 3 hours to go from B to C. Finally, he drives 120 km at 30 km/h from C to D.
Find his average speed for the journey from A to D.

	Speed	Time	Distance
A to B	50 km/h	2 hrs	100 km
B to C	40 km/h	3 hrs	120 km
C to D	30 km/h	4 hrs	120 km
	TOTALS	9 hrs	340 km

Ave Speed $= \dfrac{\text{Total Dist}}{\text{Total Time}} = \dfrac{340}{9} = 37.8$ km/h

Density, Mass, Volume



$$\text{Mass} = \text{Density} \times \text{Volume}$$

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

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

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

Example

D has a density of $5\ g/cm^3$

E has a density of $11\ g/cm^3$

If 20g of D are mixed with 44g of E

what is the density of the resulting compound

	Density	Mass	Vol
D	$5\ g/cm^3$	20g	$4\ cm^3$
E	$11\ g/cm^3$	44g	$4\ cm^3$
Totals		64g	$8\ cm^3$

$$\text{Density} = \frac{64}{8} = 8\ g/cm^3$$

Example 2 X and Y are mixed together to form compound Z

X has density $5.62\ g/cm^3$. 30g of X are mixed with 40g of Y. The density of Z is found to be $6.72\ g/cm^3$.

Find the density of Y

	Density	Mass	Vol
X	$5.62\ g/cm^3$	30 g	$5.34\ cm^3$
Y	$7.87\ g/cm^3$	40g	$5.08\ cm^3$
Z	$6.72\ g/cm^3$	70g	$10.42\ cm^3$

Density of Y = $7.87\ g/cm^3$

Exercise

8g of A which has density $3\ g/cm^3$ is mixed with $5\ cm^3$ of B which has density $2\ g/cm^3$

Find the density, mass, and volume of the resulting compound C.

	Density	Mass	Vol
A	$3\ g/cm^3$	8g	$2.67\ cm^3$
B	$2\ g/cm^3$	10g	$5\ cm^3$
C	$2.35\ g/cm^3$	18g	$7.67\ cm^3$

Compound Interest

John receives 4% compound interest for 3 years
Bill receives 2% first yr, 3% second yr, 6% third year
If both boys invest £1000, how much does each boy have at the end of third year.

John $1000 \times 1.04^3 = £1124.86$

Bill $1000 \times 1.02 \times 1.03 \times 1.06 = £1113.64$

Depreciation

A £10000 depreciates at 12% per annum for 5 years. How much is it worth then?

$10000 \times 0.88^5 = £5277.32$
