



Junior Cert Maths

Free Notes

**Average Speed and Fuel
Consumption**



Average Speed and Fuel Consumption

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

To change a time longer than an hour into a decimal, express the Total time in minutes and divide by 60

2 hours 30 mins = 150 mins

$$\frac{150}{60} = 2.5$$

1 hour 45 mins = 105 mins

$$\frac{105}{60} = 1.75$$

3 hours 20 mins = 200 mins

$$\frac{200}{60} = 3.33$$

$$\text{Fuel Consumption} = \frac{\text{Number of kilometres travelled}}{\text{Kilometres per litre}}$$

3.1

(i) A man travels from Arklow to Blanchardstown, a distance of 90 km. He leaves Arklow at 09:25 and arrives in Blanchardstown at 10:55. Calculate his average speed for the journey.

Time = 10.55 – 09.25 = 1 hour 30 mins

1 hour 30 mins = 90 mins

$$\frac{90}{60} = 1.5$$

Time = 1.5 hours

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

$$\text{Average Speed} = \frac{90}{1.5} = 60\text{km/hr}$$

(ii) He continues from Blanchardstown to Cootehill, a distance of 112 km. He increases his average speed by 4 km/hr for this section of his journey.
At what time does he arrive in Cootehill?

$$\text{Average Speed} = 60+4 = 64\text{km/hr}$$

Rearrange the formula so we have

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

$$\text{Time taken} = \frac{112}{64} = 1.75$$

$$1.75 = 1 \text{ hour } 45 \text{ mins}$$

3.2

Car A and Car B set off from a starting point S at the same time. They travel the same route to destination D, which is 70 km away. Car A travels at an average speed of 50 km/h and car B travels at an average speed of 45 km/h.
How far will car B have travelled by the time car A arrives at destination D?

Car A and Car B travel for the same amount of time.

Rearrange the formula so we have

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

Car A

$$\text{Time taken} = \frac{70}{50} = 1.4 \text{ hours}$$

Car B

$$1.4 = \frac{\text{Distance}}{45}$$

$$\text{Distance} = 45 \times 1.4$$

Distance = 63km

3.3

The time taken by Jack to travel from Derry to Waterford, a distance of 378 km, is 6 hours. His return journey from Waterford to Derry, by the same route, takes an extra 45 mins.

By how many km/hr is his average speed slower on the return journey?

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

$$\text{Average Speed} = \frac{378}{6}$$

$$\text{Average Speed} = 63 \text{ km/hr}$$

Time for return journey = 6 hours 45 mins = 405 mins

$$\frac{405}{60} = 6.75$$

$$\text{Average Speed} = \frac{378}{6.75}$$

$$\text{Average Speed} = 56 \text{ km/hr}$$

By how much is he slower?

$$63 - 56 = 7 \text{ km/hr}$$

3.4

(i) A car journey of 455 kilometres took 6 hours and 30 minutes. Calculate the average speed of the car, in km/hr, for the journey.

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

$$\text{Average Speed} = \frac{455}{6.5} = 70 \text{ km/hr}$$

(ii) If the average petrol consumption for the journey was 9.2 kilometres per Litre, calculate the number of litres used, correct to the nearest litre.

$$\text{Fuel Consumption} = \frac{\text{Number of kilometres travelled}}{\text{Kilometres per litre}}$$

$$\text{Fuel Consumption} = \frac{455}{9.2} = 49.45 \text{ litres}$$

Correct to the nearest litre 49 litres

3.5

Fuel consumption in a car is measured in litres per 100 km.
 Alan's car travels 1250 km on a tank of 68 litres.
 Calculate his car's fuel consumption in litres per 100 km.

In this case the formula does not apply as we are calculating litres per 100km rather than kilometres per litre

$$\frac{1250}{100} = \text{How many times we've travelled 100km}$$

$$12.5 = \text{How many times we've travelled 100km}$$

$$\frac{68}{12.5} = 5.44$$

5.44 litres are used per 100km

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