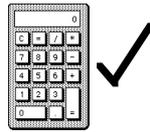


# Chapter 47



Calculators may be used in this Chapter where appropriate.

# Time Distance Speed

## Exercise 1

- Write the following times in 24 hour notation :-
  - 3:30 am
  - 6:20 pm
  - 9:09 pm
  - midnight
  - noon.
- Write the following times in 12 hour notation :-
  - 2310
  - 0705
  - 1012
  - 0004
  - 1615.
- Calculate how long it is from :-
  - 3:25 pm to 8:10 pm
  - 1745 to 2020
  - 0755 to 2210
  - 06:35 am to 11:20 am
  - 0808 to 2323
  - 10:40 am to 11:30 pm.



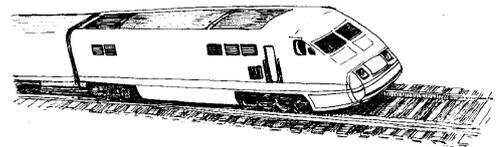
## Exercise 2

- Copy and complete the formula to calculate the distance travelled

$$D = \dots \times \dots$$

- Use your formula to calculate each of the following distances :-

- A car travelling at 40 km/hr for 3 hours.
- A runner travelling at 9 m.p.h. for 2 hours.
- A train travelling at 85 km/hr for 4 hours.
- A jet travelling for 5 hours at a speed of 450 m.p.h.



- A camel walks at 8 km/hr.

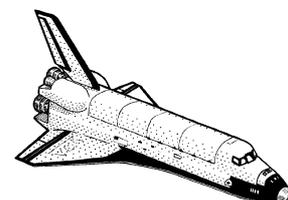
How far would it travel in :-

- 3 hours
- 30 minutes
- $\frac{1}{4}$  of an hour ?

- How far will Ellie jog at 14 km/hr if she runs for 45 minutes ?
  - How far will a car travel at 50 km/hr for 90 minutes ?

- A spaceship travels at 3000 km/hr.

How far will it travel in a day ?



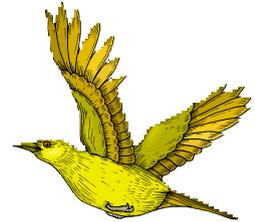
**Exercise 3**

1. Copy and complete the formula for calculating speed :-

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

2. Use your formula to calculate the following speeds :-

- (a) A car travels 180 kilometres and takes 3 hours.  
 (b) A plane flying for 8 hours and travelling 3200 miles.  
 (c) A bird flying 20 kilometres and taking 2 hours.



3. A train has to make a journey of 200 kilometres.

How fast would it need to travel to complete the journey in :-

- (a) 2 hours      (b) 4 hours      (c) 5 hours      (d)  $\frac{1}{2}$  hour ?

4. A car travelled 60 kilometres.

If the journey only took 30 minutes, calculate the speed in km/hr.

**Exercise 4**

1. Copy and complete the formula to calculate the distance travelled :-

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

2. Use your formula to calculate the time taken for each of the following :-

- (a) A car travels 240 kilometres at 60 km/hr.  
 (b) A jet travels 2000 miles at a speed of 500 m.p.h.  
 (c) A cat running at 4 metres/sec and covers 26 metres.



3. Change the following times into hours and minutes :-

- (a)  $3\frac{1}{2}$  hours      (b)  $4\frac{3}{4}$  hours      (c)  $2\frac{1}{3}$  hours      (d) 6.25 hours.

4. Change the following times to decimal form :-

- (a) 1 hr 30 mins      (b) 45 mins      (c) 4 hrs 15 mins      (d) 6 hrs 40 minutes.

5. Calculate the time taken (in hours and minutes) to :-

- (a) drive 120 km at 80 km/hr      (b) run 20 miles at 8 m.p.h.  
 (c) fly 1000 km at 300 km/hr      (d) cruise 200 miles at 30 m.p.h.  
 (e) race 400 km at 120 km/hr      (f) walk 46 miles at 5 m.p.h.

## Exercise 5

1. Find the unknown quantity in each of the following :-

(a) Distance = ? km.      Speed = 20 km/hr.      Time :  $3\frac{1}{2}$  hours.

(b) Distance = 90 miles.      Speed = ? m.p.h.      Time :  $1\frac{1}{2}$  hours.

(c) Distance = 100 km.      Speed = 40 km/hr.      Time : ? hours.

2. (a) A tortoise walks at 2 metres per minute.

How long will it take to walk 9 metres ?

(b) Addison can sprint at 4 metres per second.

How far will he travel in ten and a half seconds ?

(c) A bus journey, 60 kilometres long, takes one and a half hours.

How fast is the bus travelling ?



3. A jet has a 400 mile journey to complete.

How long would it take at a speed of :-

(a) 200 m.p.h.      (b) 800 m.p.h.      (c) 600 m.p.h. ?



4.



Jane ran round a 1500 metre track and took 6 minutes.

(a) At what speed in metres per minute was Jane running ?

(b) Bob beat Jane's time by a minute.

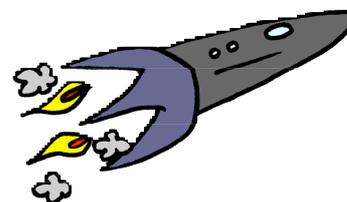
What was Bob's speed ?

5. A rocket ship is 4200 km from Earth.

The rocket then travels away from Earth at its maximum speed of 2400 km/hr for  $4\frac{1}{2}$  hours.

(a) How far away from Earth is the spaceship now ?

(b) How quickly can the spaceship then return to Earth, travelling at its maximum speed ?



6. Ryan cycled from home to school (8 km) at a speed of 16 km/hr. He had to walk home from school due to a puncture.

If Ryan walked at a speed of 6 km/hr, how much quicker was he cycling than walking ?



**Exercise 6**

1. Change the following to decimals of an hour :-

- (a) 45 minutes      (b) 24 minutes      (c) 36 minutes      (d) 27 minutes.

2. Change the following to decimals of a hour giving your answer to two decimal places :-

- (a) 7 minutes      (b) 40 minutes      (c) 8 minutes      (d) 124 minutes.

3. Change each time to decimal form :-

- (a) 2 hrs 33 mins      (b) 1 hr 48 mins      (c) 5 hrs 6 mins      (d) 3 hrs 3 mins.



4. Calculate the unknown quantity in each of the following :-

- (a) Distance = ? km      Speed = 80 km/hr      Time : 2 hrs 45 mins.  
 (b) Distance = 70 miles      Speed = ? m.p.h.      Time : 1 hr 24 mins.  
 (c) Distance = 420 km      Speed = 50 km/hr      Time : ? hrs ? mins .

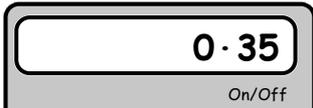
5. The distance between two towns Hurley and Burley is 48 kilometres. Gerry drives a truck from Hurley to Burley at a speed of 30 km/hr. On the return trip he increases his speed by 6 km/hr.



How much faster was the return trip ?

**Exercise 7**

1. Change the calculator displays (shown in hours) to hours and minutes :-

- (a)       (b)       (c) 

2. Change each of the following to hours and minutes :-

- (a) 4.6 hours      (b) 8.15 hours      (c) 3.05 hours      (d) 1.125 hours.

3. Calculate the time taken in hours and minutes for the following journeys :-

- (a) A rally car travelling 150 kilometres at 40 km/hr.  
 (b) A marathon runner (26 miles) at a speed of 12 m.p.h.  
 (c) A speed boat at 40 km/hr travelling 36 kilometres.

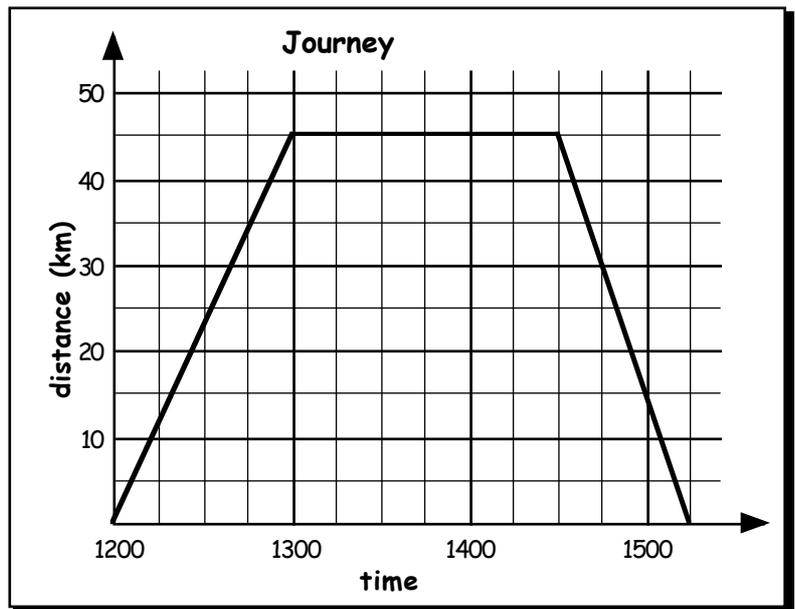


4. Change each of the following speeds to km/hr :-

- (a) 20 m/sec      (b) 250 m/sec      (c) 10.5 m/sec      (d) 50 cm/min.

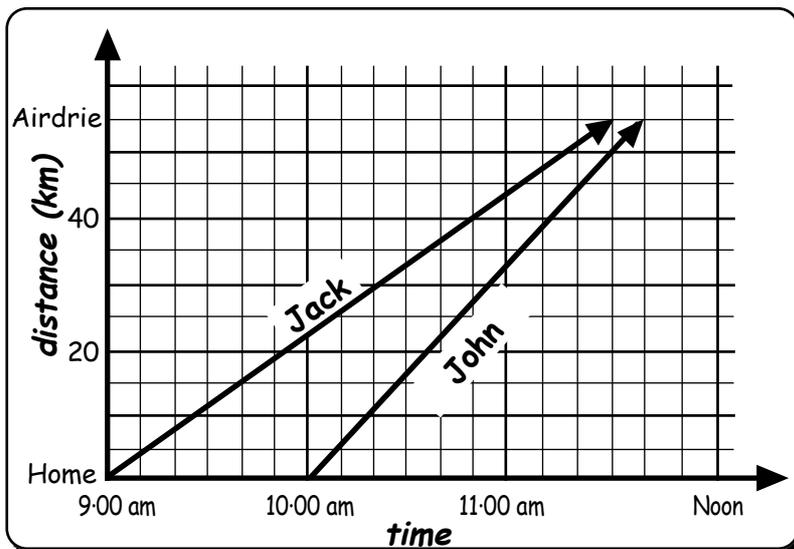
**Exercise 8**

1. The distance-time graph shows the journey Maggie made from her house to her favourite clothes shop and home again.



- (a) How long did the drive to the shop take ?
- (b) How far away is the shop from her house ?
- (c) How long did she stay at the shop ?
- (d) Calculate Maggie's speed :-
  - (i) going to the shop.
  - (ii) on the journey home.

2. On Saturday, sisters Jackie and Gill both leave from home and drive to Airdrie.

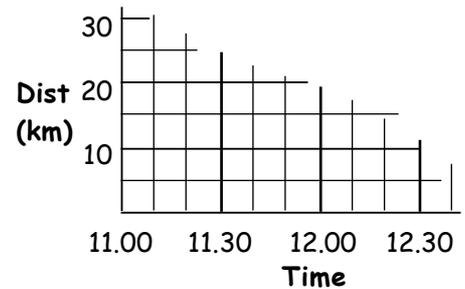


- (a) At what time did each of the sisters leave their house ?
- (b) How far away is Airdrie from their house ?
- (c) Who arrived in Airdrie first and by how many minutes ?
- (d) Calculate the speed of each sister.
- (e) Jackie left Airdrie at Noon and drove home at 25 km/hr. Gill drove home at 30 km/hr.

If both sisters arrived home at the same time, when must Gill have left Airdrie (to the nearest minute) ?

3. Billy set off at 11:00 am on Sunday and drove 50 miles to Edinburgh at an average speed of 40 mph. He shopped for 45 minutes in Edinburgh, then drove home at an average speed of 50 mph.

Show Billy's journey on a Distance - Time graph.



4. Helen left home at ten past nine, driving at a speed of 60 km/hr, but found she had a puncture after just 20 km. It took her 40 minutes to get the puncture repaired and she then drove straight back home at 50 km/hr. Show this journey on a Distance - Time graph.



### Revision Exercise

1. Choose the appropriate formula and show all working in each of the following :-

- (a) Pauline drove 300 kilometres at 60 km/hr. How long did she take ?  
 (b) Arnie flew at 120 m.p.h. for 4 hours. How far had Arnie flown ?  
 (c) Kevin took 4 hours to cycle 60 kilometres. How fast was he cycling ?



2. Change each of the following times to decimals :-

- (a) 48 mins                      (b) 3 hrs 12 mins      (c) 1 hr 42 mins.

3. Change each time to hours and minutes :-

- (a) 2.25 hours                      (b) 0.45 hours              (c) 5.05 hours.

4. (a) Fred takes three quarters of an hour to drive 42 km to work.

What is Fred's average speed ?

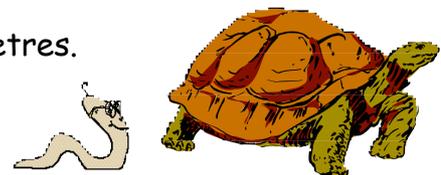
- (b) Jeri drives at 80 km/hr and takes 1 hour and 12 minutes to get to work.

How far does Jeri drive to work ?

- (c) Terry the tortoise takes 40 minutes to crawl 16 metres.

Sally Slug slithers 900 centimetres in 30 minutes.

How much faster is Terry than Sally ?



5. Last Sunday, Chelsea left home at Noon and cycled 20 kilometres to her office. She arrived at 1:20 pm and spent 10 minutes collecting the papers she had forgotten. She then cycled home and arrived at 2 pm.

- (a) Show all the given information on a distance-time graph.

- (b) Calculate the speed of her journey :- (i) to the office      (ii) home.