

Average speed

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

Units : m/s or km/h

$$\text{Average Speed} = \frac{\text{Total distance}}{\text{Total time}}$$

Units : m/s or km/h

To convert from $\frac{m}{s}$ to $\frac{km}{h}$ multiply by $\frac{18}{5}$

to convert from $\frac{km}{h}$ to $\frac{m}{s}$ multiply by $\frac{5}{18}$

The area below the speed time graph gives you the distance

EXAMPLES:

- 3 The top speed of a car is 54 metres per second.
Change this speed into kilometres per hour.

0580/2, 0581/2 Jun 2003

Answerkm/h [2]

- 4 The maximum speed of a car is 252 km/h.
Change this speed into metres per second.

0580/23/M/J/10

Answer m/s [2]

- 12 A train leaves Barcelona at 21 28 and takes 10 hours and 33 minutes to reach Paris.

- (a) Calculate the time the next day when the train arrives in Paris.

0580/21/M/J/11

Answer(a) [1]

- (b) The distance from Barcelona to Paris is 827 km.

Calculate the average speed of the train in kilometres per hour.

Answer(b) km/h [3]

8 The Canadian Maple Leaf train timetable from Toronto to Buffalo is shown below.

Toronto	1030
Oakville	1052
Aldershot	1107
Grimsby	1141
St Catharines	1159
Niagra Falls	1224
Buffalo	1325

0580/02/N/06

(a) How long does the journey take from Toronto to Buffalo?

Answer(a) h min [1]

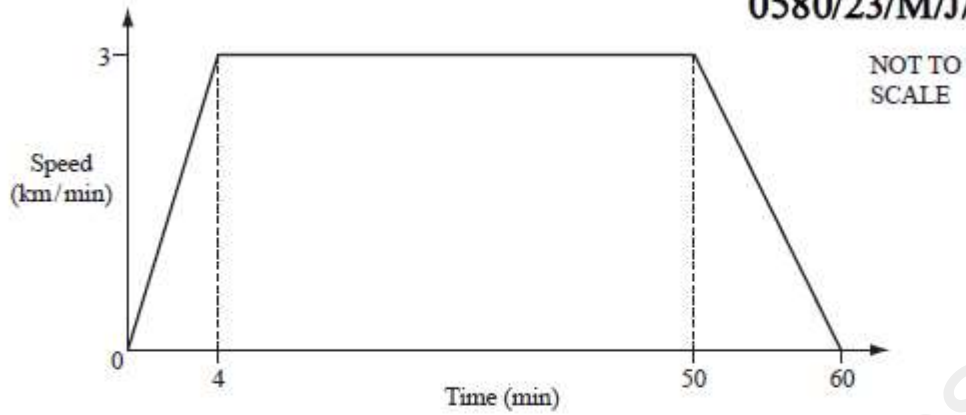
(b) This journey is 154 kilometres. Calculate the average speed of the train.

Answer(b) km/h [2]

M/J/2003

3 The top speed of a car is 54 metres per second.
Change this speed into kilometres per hour.

Answer km/h [2]



A train journey takes one hour.
The diagram shows the speed-time graph for this journey.

- (a) Calculate the total distance of the journey.

Give your answer in kilometres.

Answer(a) km [3]

- (b) (i) Convert 3 kilometres/minute into metres/second.

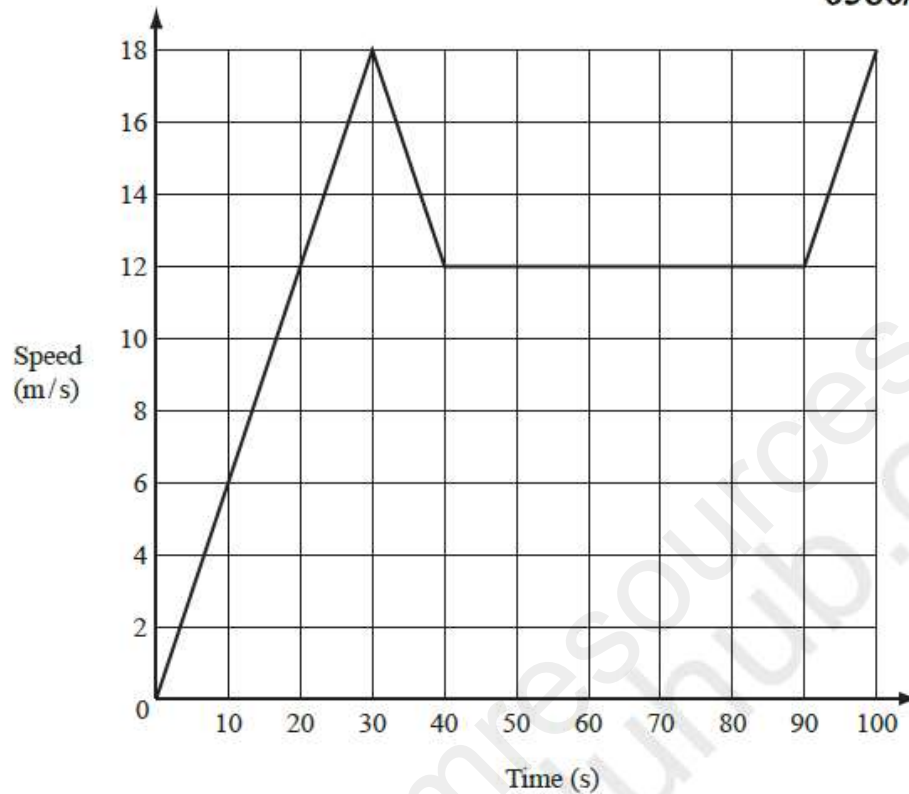
Answer(b)(i) m/s [2]

- 8 A cruise ship travels at 22 knots.

[1 knot is 1.852 kilometres per hour.]

Convert this speed into metres per second.

Answer m/s [3]



The diagram shows part of a journey by a truck.

- (a) The truck accelerates from rest to 18 m/s in 30 seconds.
Calculate the acceleration of the truck.

Answer(a) m/s² [1]

- (b) The truck then slows down in 10 seconds for some road works and travels through the road works at 12 m/s.
At the end of the road works it accelerates back to a speed of 18 m/s in 10 seconds.
Find the **total** distance travelled by the truck in the 100 seconds.
