

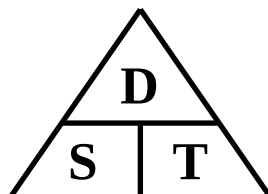
Lesson 8

GCSE Mathematics Kinematics

8.1 TEST

You May Use A Calculator

Question 1



By using the constant speed formula triangle, or otherwise, write down a formula for *speed* in terms of *time* and *distance*

speed =

[2 marks]

Question 2

(i) How many metres are in a kilometre ?

(ii) How many minutes are in a day ?

[2 marks]

Question 3

Slider, my pet snake, moves at a constant speed of 0.4 ms^{-1} for 15 minutes.

(i) How many seconds are in 15 minutes ?

(ii) How far does Slider travel in this time ?

(iii) Is this more or less than $\frac{1}{4} \text{ km}$?

[4 marks]

Question 4

A woman leaves her house at 5.04 pm.

She jogs at a steady speed of 2 m/s returning home at 5.31 pm.

- (i) For how long did the woman jog ?
Give your answer in seconds.

[2 marks]

- (ii) How far did the woman travel ?
Give your answer in metres.

[2 marks]

- (iii) Change your part (ii) answer into km.

[1 mark]

Question 5

A speed boat accelerates uniformly from a speed of 8 ms^{-1} to a speed of 26 ms^{-1} over 10 seconds.

- (i) What is the average speed of the speed boat over the 10 seconds ?

[1 mark]

- (ii) Use the formula;

$$\text{Distance} = \text{Average Speed} \times \text{Time}.$$

to calculate the distance the speed boat covers whilst accelerating.

[1 mark]

Question 6

In mathematics the Greek letter delta, Δ , is used for the word *change*

A man's weight, W , increases from 61.9 kg to 72.4 kg

What is ΔW ?

[1 mark]

Question 7

On a speed-time graph;

- (i) What does the “gradient of a line” represent ?

[1 mark]

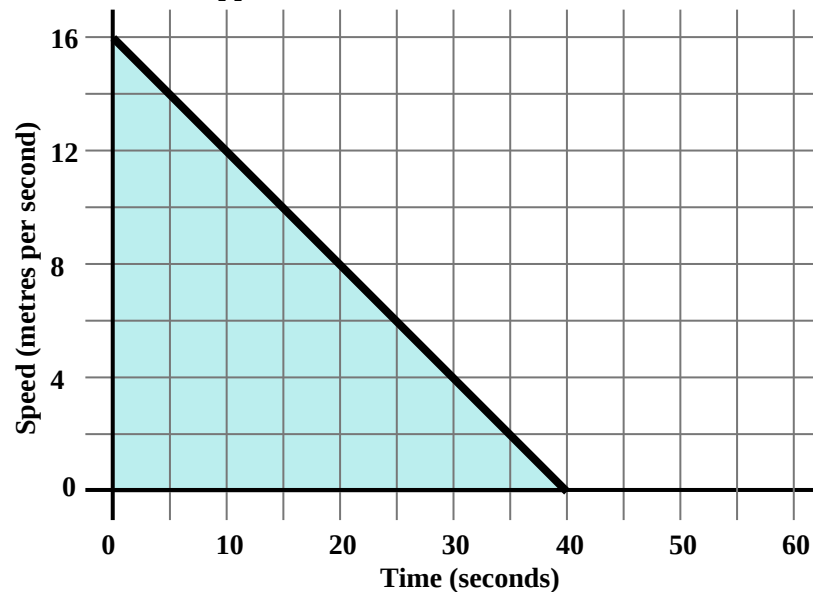
- (ii) What does the “area under the graph” represent ?

[1 mark]

Question 8

The Speed-Time graph is of a train approaching a STOP sign.

At $t = 0$ the train first applies the brakes.



- (i) What speed was the train doing when it first applies the brakes ?

[1 mark]

- (ii) How long did it take for the train to stop ?

[1 mark]

- (iii) What distance does the train travel whilst stopping ?

[2 marks]

- (iv) The train first applied the brakes when the STOP sign was 0.5 km away.
Does it stop before or after reaching the STOP sign ?

[1 mark]

- (v) What was the train's rate of deceleration ?

[2 marks]

Question 9

GCSE Examination Question from May 2009, Q2

Omar travelled from Nairobi to Mombasa by train.

The journey took 13 hours 15 minutes.

The average speed was 40 km/h.

Work out the distance, in km, from Nairobi to Mombasa.

[3 marks]

Question 10

- (i) I move from a point with x coordinate 9 to a point with x coordinate 15.
What is Δx ?

[1 mark]

- (ii) I move from a point with y coordinate 8 to a point with y coordinate 32.
What is Δy ?

[1 mark]

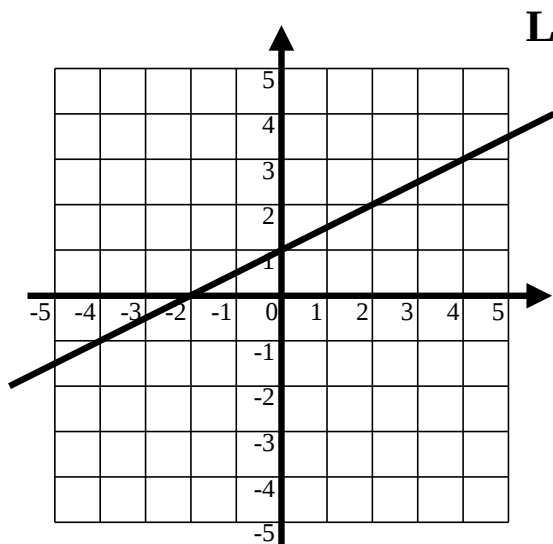
- (iii) Use your part (i) and part (ii) answers to help calculate the gradient
between the points with coordinates (9, 8) and (15, 32).

[2 marks]

Question 11

GCSE Examination Question from May 2008, Q14 (a) (i)

A line, **L**, passes through the points $(0, 1)$ and $(4, 3)$



Find the gradient of the line **L**

[2 marks]

Question 12

GCSE Examination Question from November 2006, Q5

Bridget flew from the UK to Dubai.

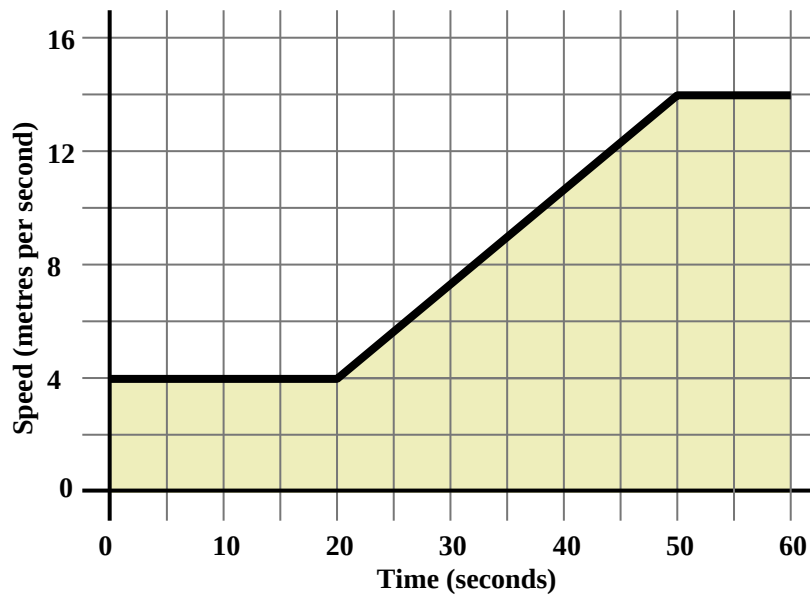
Her flight from the UK to Dubai covered a distance of 5456 km.

The flight time was 7 hours 45 minutes.

Work out the average speed of the flight in km/h

[3 marks]

Question 13



A car's speed over a sixty second period is given by the Speed-Time graph.

(i) Between which two times was the car accelerating ?

[1 mark]

(ii) Calculate the rate of acceleration.

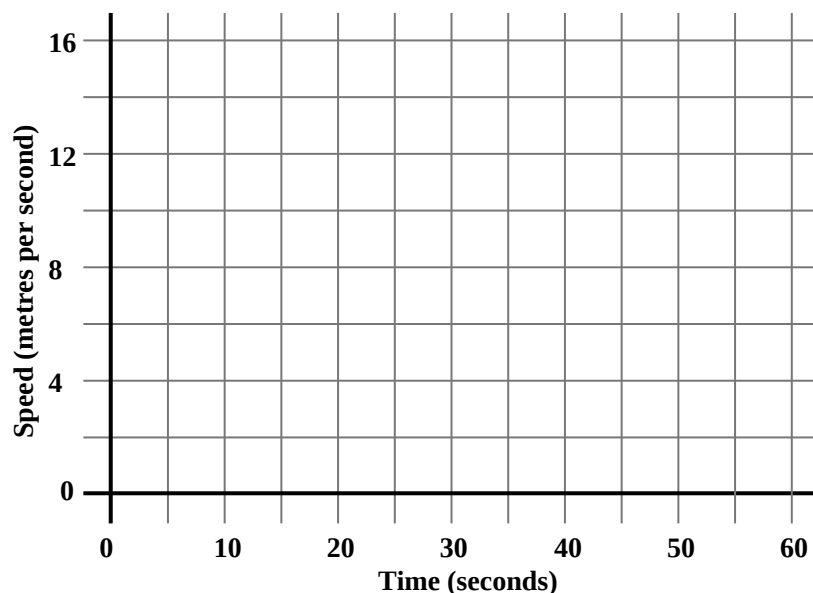
[2 marks]

(iii) Calculate the total distance travelled by the car over the sixty seconds.
Clearly show your working.

[4 marks]

Question 14

A car is moving at a constant speed of 4 ms^{-1} between $t = 0$ and $t = 30$ seconds.
Then, over 20 seconds, it accelerates uniformly to a speed of 14 ms^{-1}
It then moves at a constant speed of 14 ms^{-1} for 10 seconds.



Draw the Speed - Time graph for the car movements described.

[3 marks]

Question 15

GCSE Examination Question from November 2008, Q4

A train travels 165 km.
The average speed for the journey is 60 km/h.

Work out the time that this journey takes.
Give your answer in hours and minutes.

[3 marks]

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