

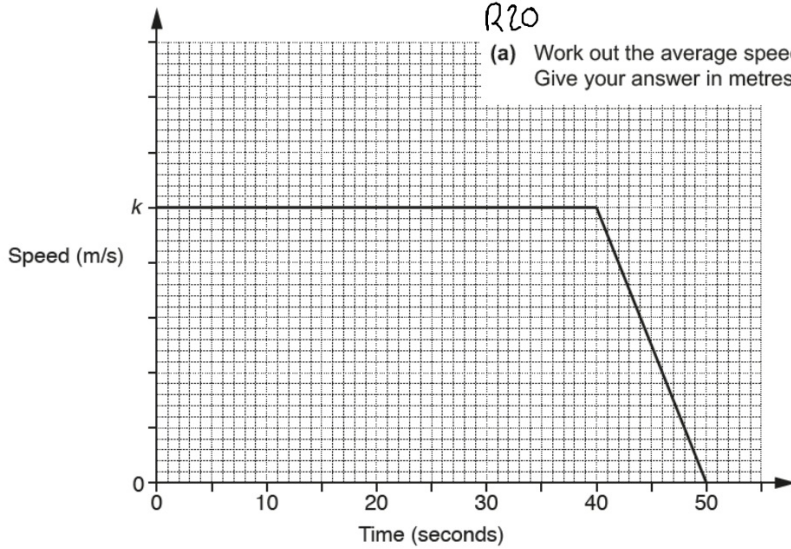
A29...Velocity Time Graphs-Straight Lines

OCR

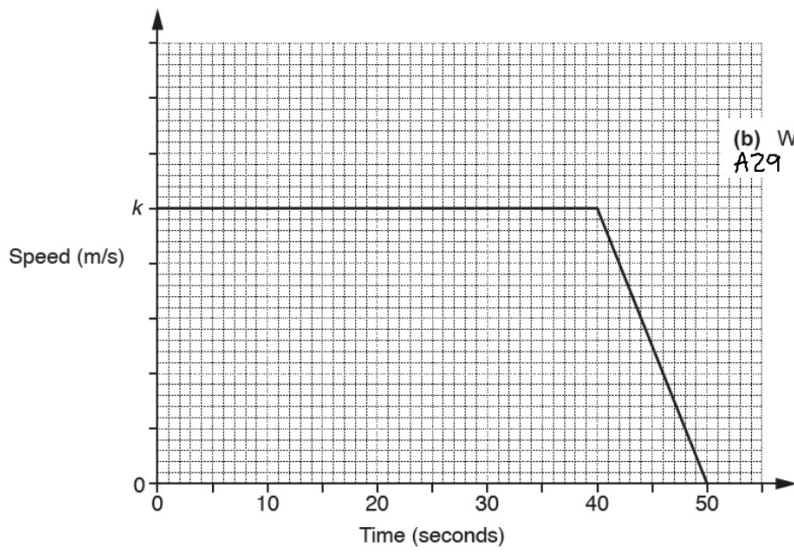
- 13 The graph shows information about the speed of a vehicle during the final 50 seconds of a journey.
 At the start of the 50 seconds the speed is k metres per second.
 The distance travelled during the 50 seconds is 1.35 kilometres.

R20

- (a) Work out the average speed of the vehicle during the 50 seconds.
 Give your answer in metres per second.

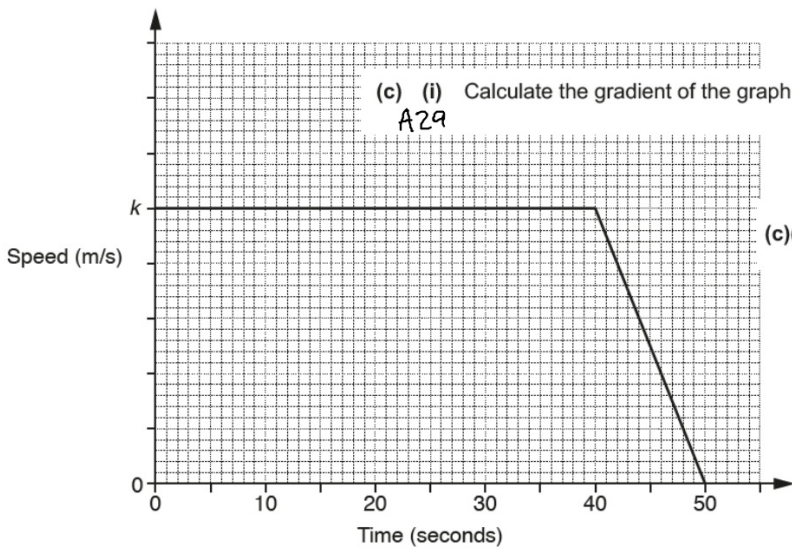


(a) m/s [2]



(b) Work out the value of k .
A29

(b) $k = \dots\dots\dots$ [5]



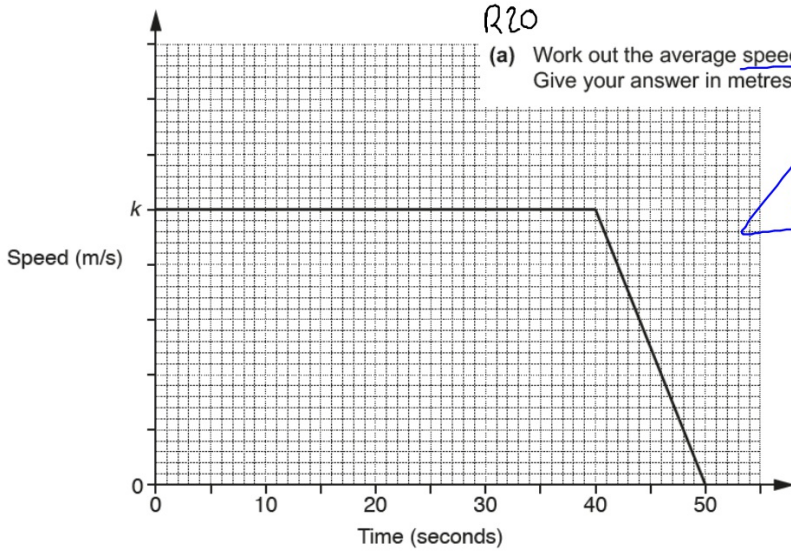
(c) (i) Calculate the gradient of the graph in the final 10 seconds of the journey.

A29

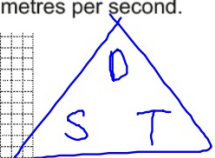
(c)(i) [1]

(ii) Describe what this gradient represents.

- 13 The graph shows information about the speed of a vehicle during the final 50 seconds of a journey. Created by W Neill
 At the start of the 50 seconds the speed is k metres per second.
 The distance travelled during the 50 seconds is 1.35 kilometres.



- (a) Work out the average speed of the vehicle during the 50 seconds.
 Give your answer in metres per second.

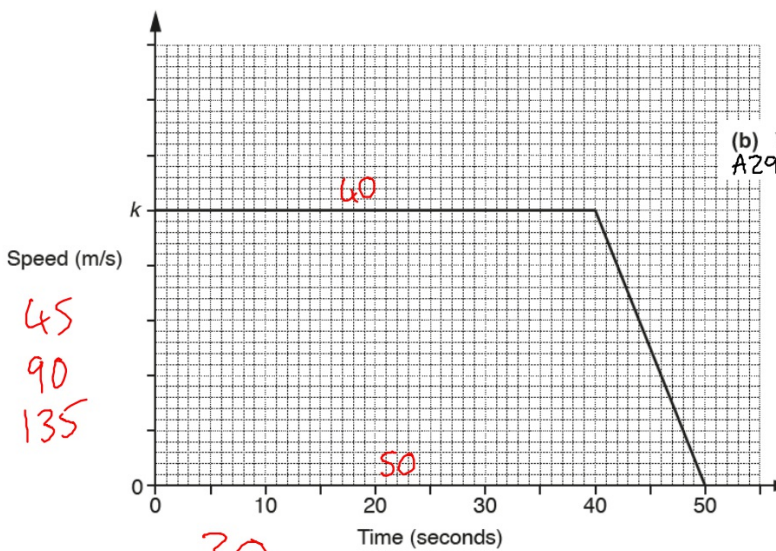


$$5 \overline{) 135} \begin{array}{r} 27 \\ \underline{10} \\ 35 \\ \underline{30} \\ 5 \end{array}$$

$$S = \frac{1350}{50}$$

$$S =$$

(a) 27 m/s [2]



(b) Work out the value of k .
A29

Area under graph is distance travelled.

$$\frac{1}{2}(a+b)h = 1350 \text{ m}$$

$$\frac{1}{2}(90)k = 1350$$

$$45k = 1350$$

$$k = \frac{1350}{45}$$

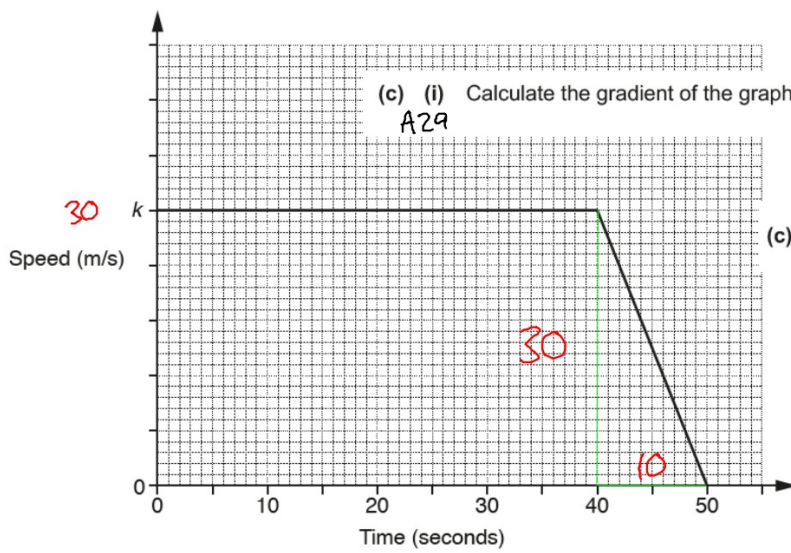
(b) $k = \dots\dots\dots \frac{1350}{45} \dots\dots [5]$

ans = $k = 30$

45
90
135

$$45 \overline{) 1350} \quad \begin{array}{r} 30 \\ \underline{45 \times 30} \\ 1350 \end{array}$$

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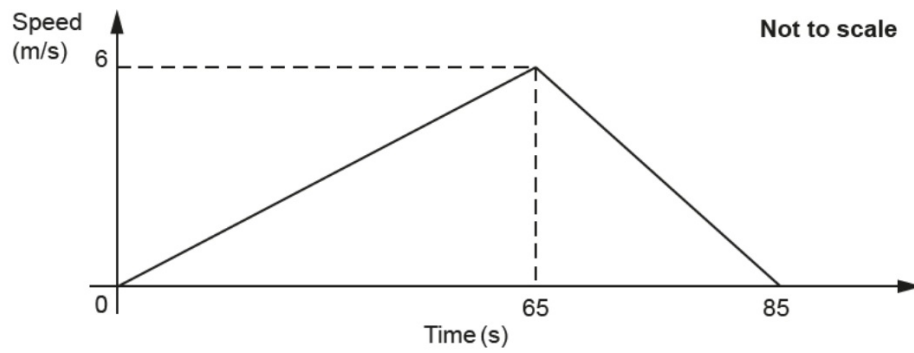
$$\frac{v}{h} = \frac{-30}{10} = -3 \checkmark$$

(c)(i) [1]

(ii) Describe what this gradient represents.

deceleration m/s^2 ✓

8 The graph shows the speed of a tram as it travels from the library to the town hall. Created by W Neill

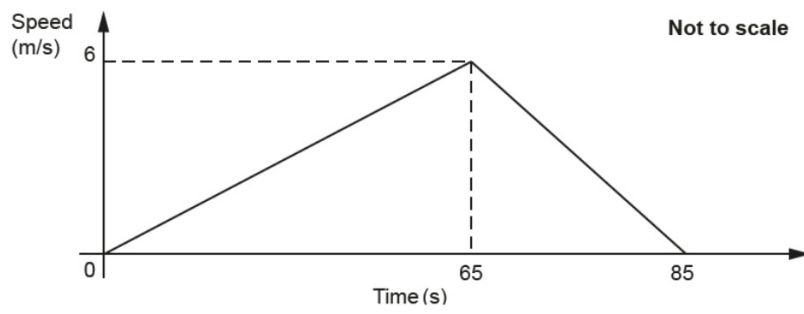


(a) Calculate the deceleration of the tram as it approaches the town hall.

(a) m/s^2 [2]

The graph shows the speed of a tram as it travels from the library to the town hall.

Created by W Neill

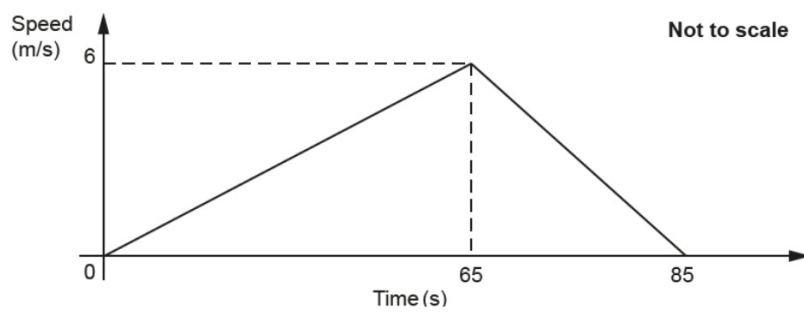


(b) Calculate the distance travelled by the tram between the library and the town hall.

(b) m [3]

The graph shows the speed of a tram as it travels from the library to the town hall.

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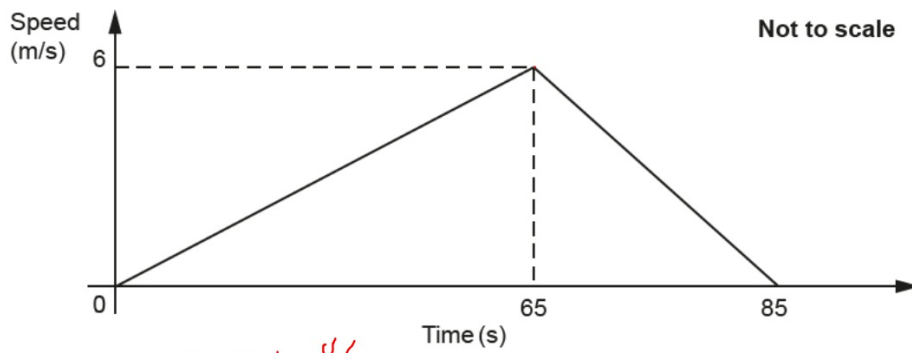


- (c) What was the maximum speed of the tram as it travelled between the library and the town hall?
Give your answer in **kilometres per hour**.

(c) km/h [4]

8 The graph shows the speed of a tram as it travels from the library to the town hall. Created by W Neill

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(a) Calculate the deceleration of the tram as it approaches the town hall.

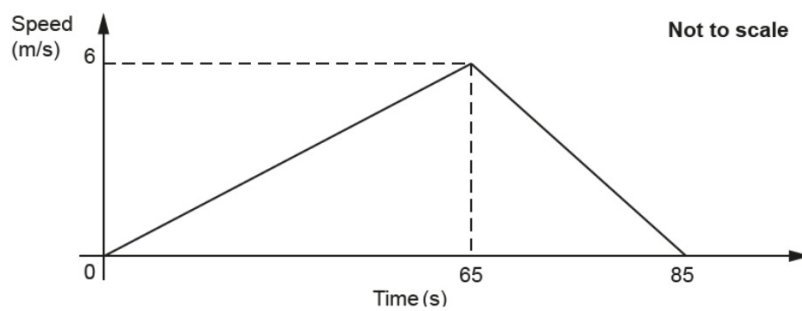
gradient $\frac{v}{h}$

$$\frac{v}{h} = \frac{6}{20}$$

(a) 0.3 m/s² [2]

The graph shows the speed of a tram as it travels from the library to the town hall.

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(b) Calculate the distance travelled by the tram between the library and the town hall.

Area under graph

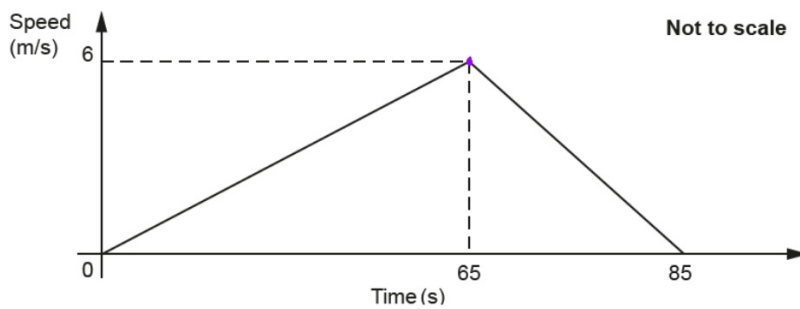
$$\Delta = \frac{B \times H}{2} = \frac{85 \times 6}{2}$$

255

(b) m [3]

The graph shows the speed of a tram as it travels from the library to the town hall.

Created by W Neill



- (c) What was the maximum speed of the tram as it travelled between the library and the town hall?
R?? Give your answer in kilometres per hour.

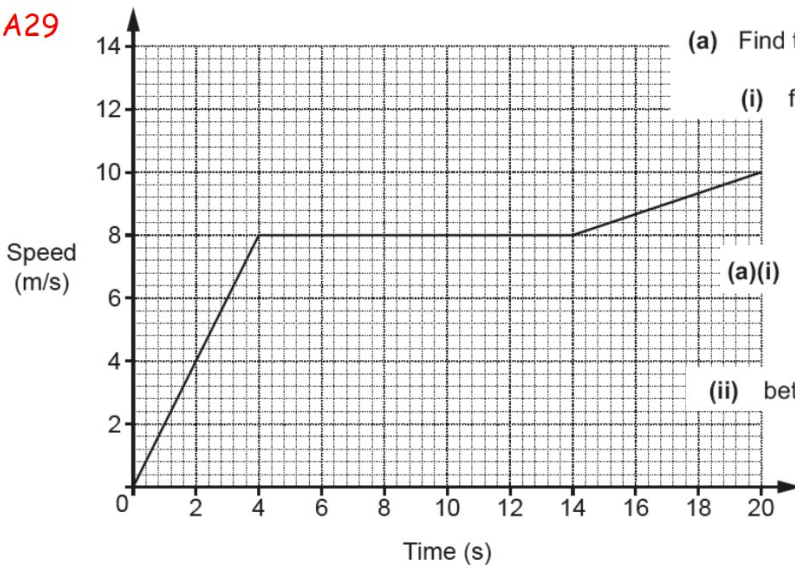
$$1000\text{m} = 1\text{km}$$

$$6\text{ metres} = 1\text{ second} \begin{matrix} \downarrow \times 60 \\ \text{min} \end{matrix}$$
$$21600\text{m} = 1\text{hr} \begin{matrix} \downarrow \times 60 \\ \text{min} \end{matrix}$$
$$21.6\text{ km/ph}$$

(c) 21.6 km/h [4]

8 The graph shows the speed of a cyclist during 20 seconds of a journey.

A29



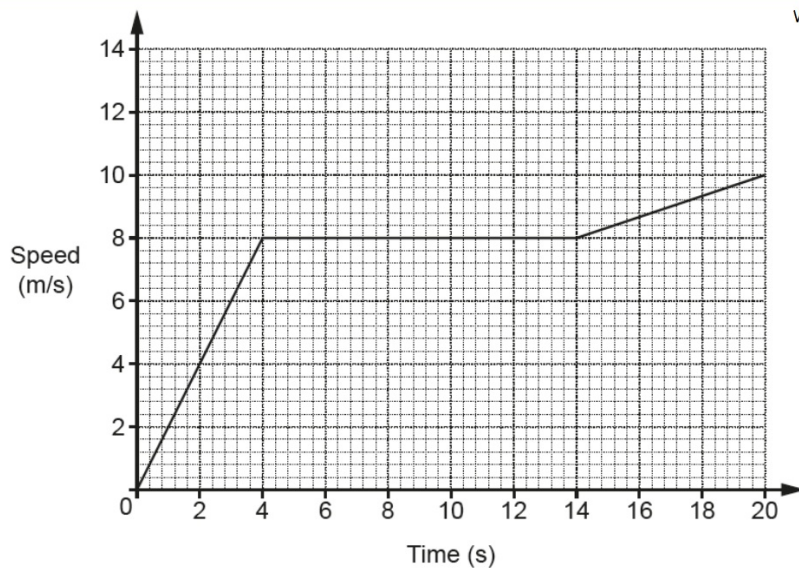
(a) Find the acceleration of the cyclist

(i) for the first 4 seconds

(a)(i) m/s² [2]

(ii) between 4 seconds and 14 seconds.

(ii) m/s² [1]

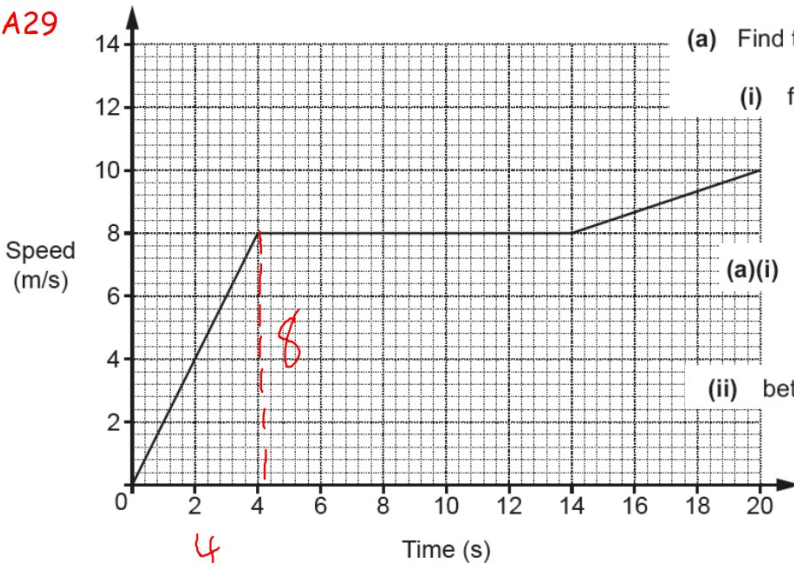


(b) Work out the distance travelled by the cyclist during the 20 seconds.

(b) m [4]

8 The graph shows the speed of a cyclist during 20 seconds of a journey.

A29



(a) Find the acceleration of the cyclist

(i) for the first 4 seconds

$\frac{v}{h} = \frac{8}{4}$

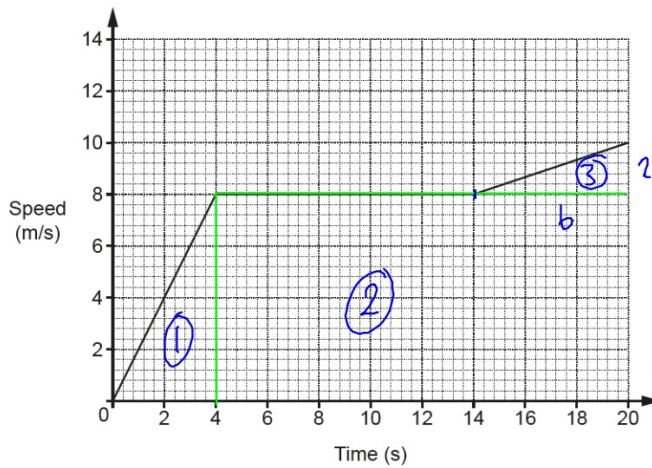
(a)(i) 2 m/s² [2]

(ii) between 4 seconds and 14 seconds.

no gradient

(ii) 0 m/s² [1]

gradient



$$\textcircled{1} \frac{B \times H}{2} = \frac{4 \times 8}{2} = 16 \text{ m}$$

$$\textcircled{2} 16 \times 8 = 128 \text{ m}$$

$$\textcircled{3} \frac{B \times H}{2} = \frac{6 \times 2}{2} = 6 \text{ m}$$

$$= 16 + 128 + 6$$

(b) Work out the distance travelled by the cyclist during the 20 seconds.

area under graph.

=

(b) 150 m ✓ m [4]

Edexcel

AQA

27 (b) Complete this table with consistent metric units.

[2 marks]

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Distance	Time	Speed	Acceleration
m	s		

(b) Complete this table with consistent metric units.

[2 marks]

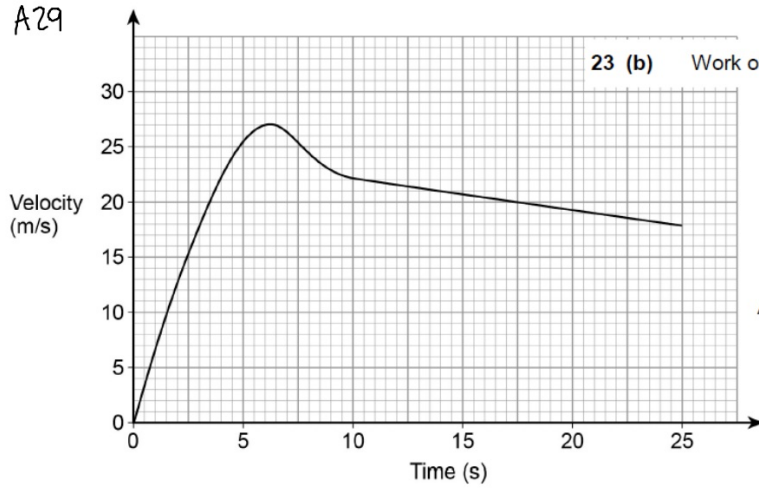
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Distance	Time	Speed	Acceleration
m	s	m/s	m/s ²
metres	seconds		

23 Here is a velocity-time graph of a motorbike for 25 seconds.

Video created by W Neill

A29



Answer _____ metres

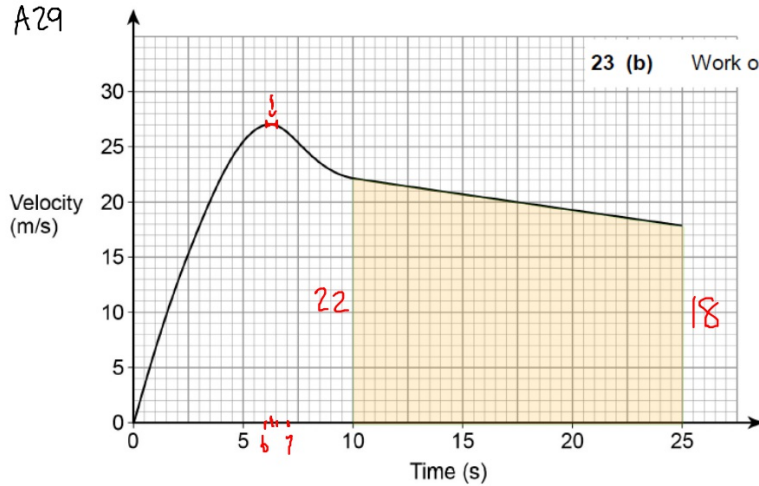
23 (a) After how many seconds was the acceleration zero?

Answer _____ seconds

23 Here is a velocity-time graph of a motorbike for 25 seconds.

Video created by W Neill

A29



Area

$$\frac{1}{2}(a+b)h$$
$$\frac{1}{2}(18+22)15$$
$$(20)15$$

300 ✓

Answer 300 metres

23 (a) After how many seconds was the acceleration zero?

Answer 6 - 6¹/₂ seconds

24

Beth ran a 200 metre race.

Video created by W Neill

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Here is a graph of the first 8 seconds of her race.

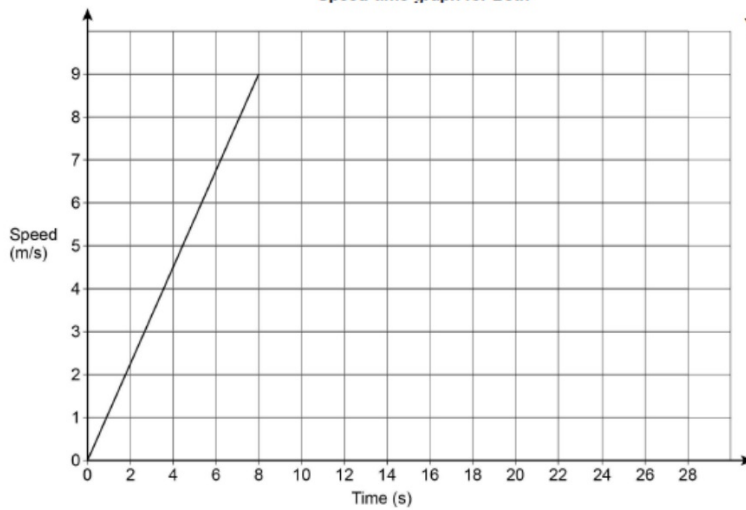
She completed the race at a constant speed of 9 m/s

Amy completed the race in 27 seconds.

Did Beth finish before Amy?

You must show your working. [3 marks]

Speed-time graph for Beth



24

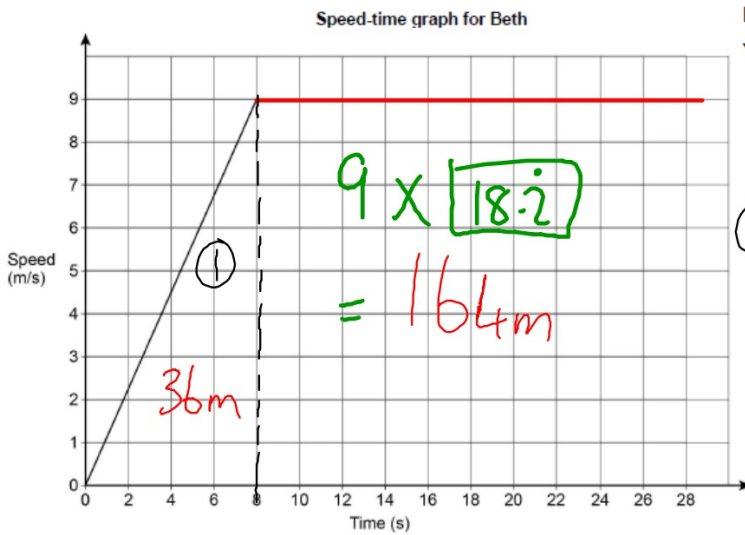
Beth ran a 200 metre race.

A29

Here is a graph of the first 8 seconds of her race.

She completed the race at a constant speed of 9 m/s

Video created by W Neill



$$200 - 36 = 164$$

Amy completed the race in 27 seconds.

Did Beth finish before Amy?

You must show your working. [3 marks]

Distance = Area under graph

$$\textcircled{1} \frac{B \times H}{2} = \frac{8 \times 9}{2} = 36m$$

$$\begin{array}{r} \text{Beth} \quad 8 \text{ sec} \\ + 18.2 \text{ sec} \\ \hline 26.2 \text{ sec} \end{array}$$

Beth finishes first $26.2 < 27 \text{ sec}$

28 Izzy runs an 80-metre race in 14 seconds.

Video created by W Neill

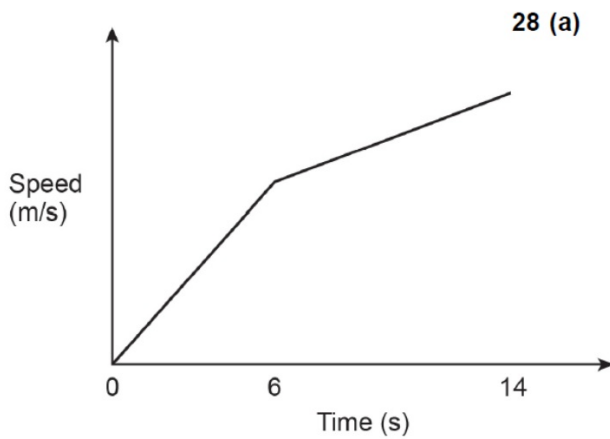
A29

During the first 6 seconds her speed increases at a constant rate.

During the last 8 seconds her speed increases at a different constant rate.

Her speed at 14 seconds is 2 m/s more than her speed at 6 seconds.

Here is a sketch of her speed-time graph.



Work out her acceleration during the last 8 seconds.

State the units of your answer. **[2 marks]**

Answer _____

28 Izzy runs an 80-metre race in 14 seconds.

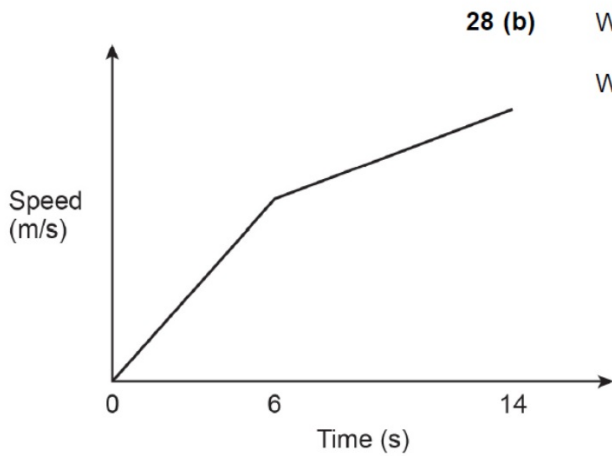
Video created by W Neill

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28 (b)

When Izzy finishes the 80-metre race, her speed is v m/s

Work out the value of v . **[4 marks]**

Answer _____

28 Izzy runs an 80-metre race in 14 seconds.

Video created by W Neill

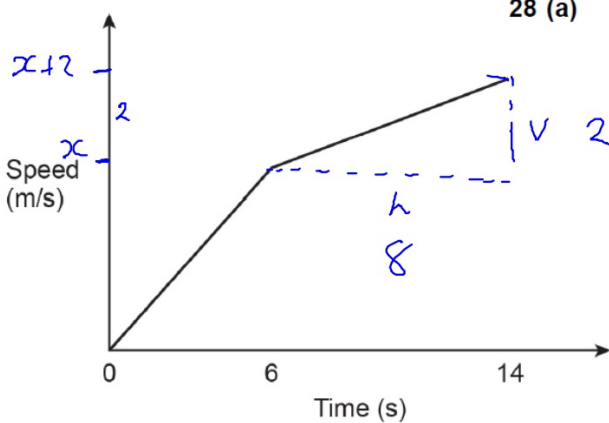
A29

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Here is a sketch of her speed-time graph.



28 (a)

Work out her ^{gradient} acceleration during the last 8 seconds.
State the units of your answer. [2 marks]

$$\frac{2}{8} = \frac{1}{4}$$

$$\frac{1}{4} \text{ m/s}^2$$

Answer _____

28 Izzy runs an 80-metre race in 14 seconds.

Video created by W Neill

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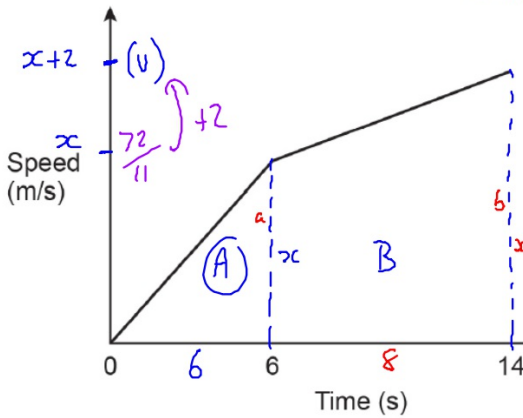
Her speed at 14 seconds is 2 m/s more than her speed at 6 seconds.

Here is a sketch of her speed-time graph.

distance travelled area under curve.

28 (b) When Izzy finishes the 80-metre race, her speed is v m/s

Work out the value of v . [4 marks]



(A) $\frac{B \times H}{2} = \frac{6x}{2} = 3x$

(B) $\frac{1}{2}(a+b)h$
 $\frac{1}{2}(x + x+2)8$
 $\frac{1}{2}(2x+2)8$
 $8x+8$

$3x + 8x + 8$
 $11x + 8 = 80$
 $11x = 72$
 $x = \frac{72}{11}$

Ans $\frac{72}{11} + 2$

Answer $\frac{94}{11}$ ✓