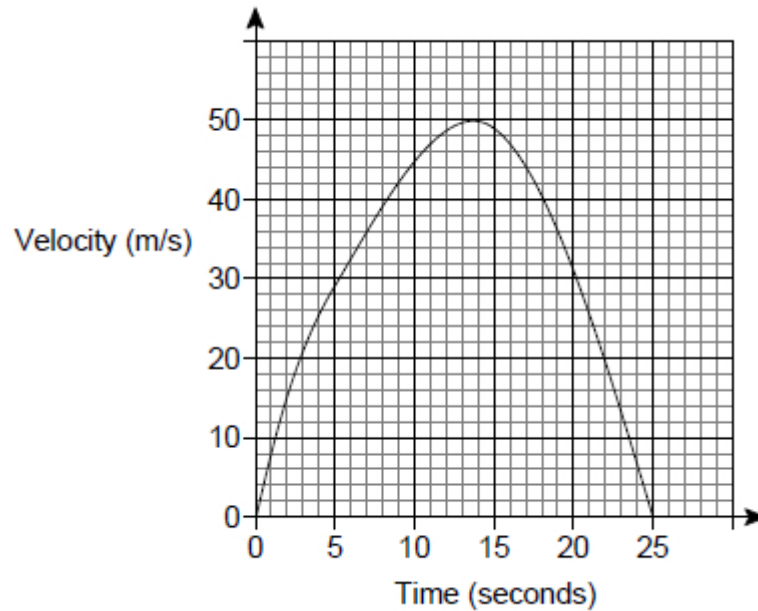


## Non-Calculator

**Q1.**

Here is a velocity-time graph of a car.



Estimate the distance travelled in the first 10 seconds.

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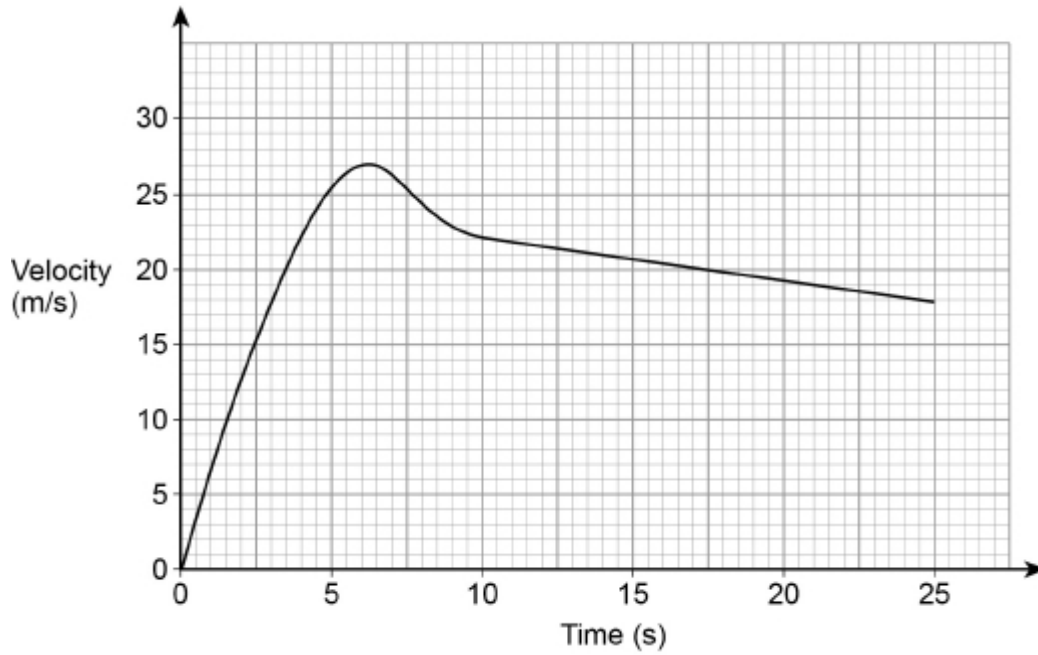
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Answer ..... metres  
(Total 2 marks)

**Q2.**

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



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

Answer \_\_\_\_\_ seconds

(1)

(b) Work out the distance travelled in the last 15 seconds.

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Answer \_\_\_\_\_ metres

(2)

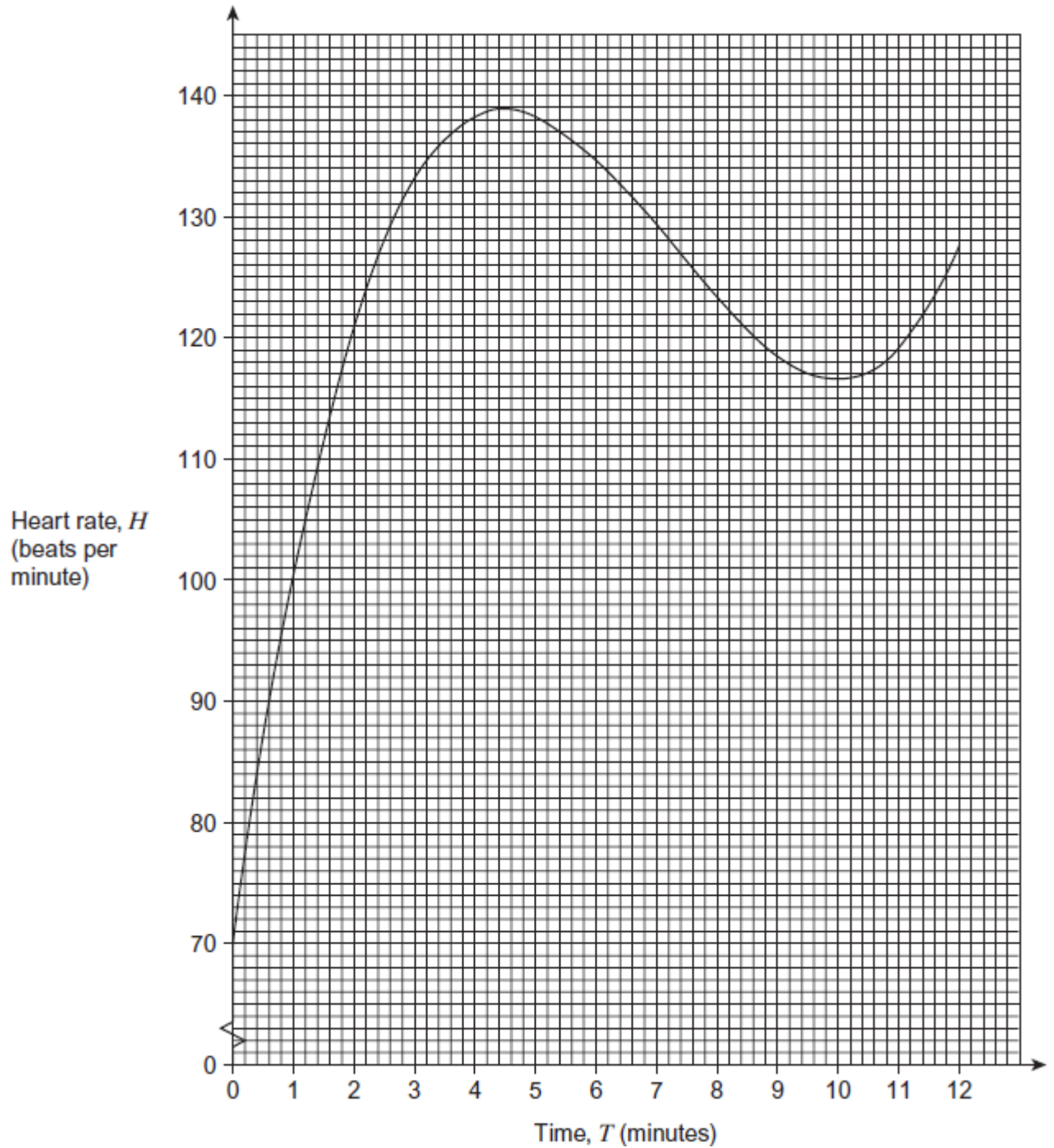
(Total 3 marks)

## Calculator

**Q3.**

Leroy goes to a gym to exercise.

The graph shows his heart rate,  $H$  (beats per minute) during 12 minutes of exercise.



(a) What was his heart rate when he started to exercise?

Answer \_\_\_\_\_ beats per min  
(1)

(b) How many minutes of exercise did it take for him to reach his highest heart rate?

Answer \_\_\_\_\_ min  
(1)

(c) By drawing a tangent, work out the rate of increase of  $H$  when  $T = 4$   
You **must** show your working.

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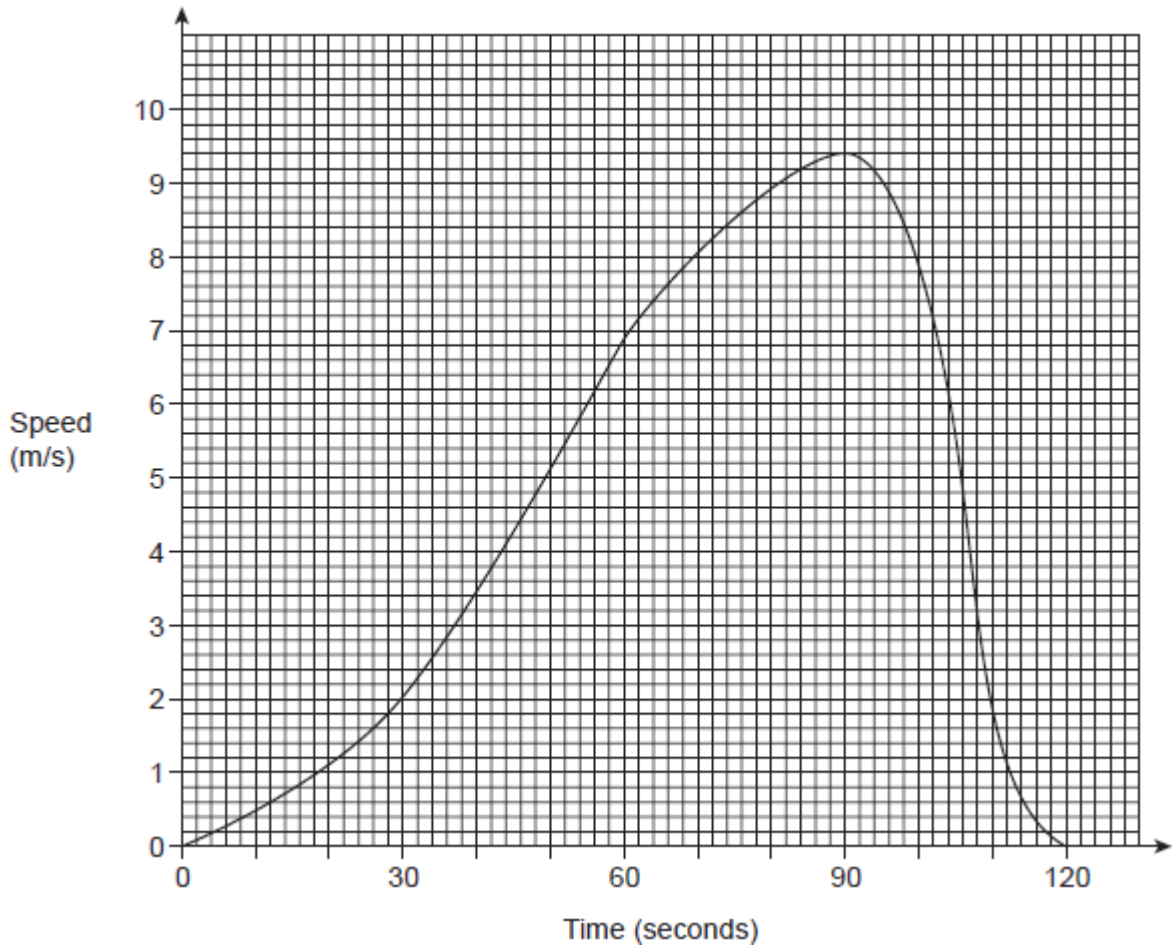
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Answer \_\_\_\_\_ beats per min<sup>2</sup>  
(3)  
(Total 5 marks)

**Q4.**

The graph shows the speed of a snowboarder for 2 minutes.



- (a) Estimate the distance travelled by the snowboarder.  
State the units of your answer.

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Answer \_\_\_\_\_

(4)

(b) Work out the gradient of the graph at 70 seconds.

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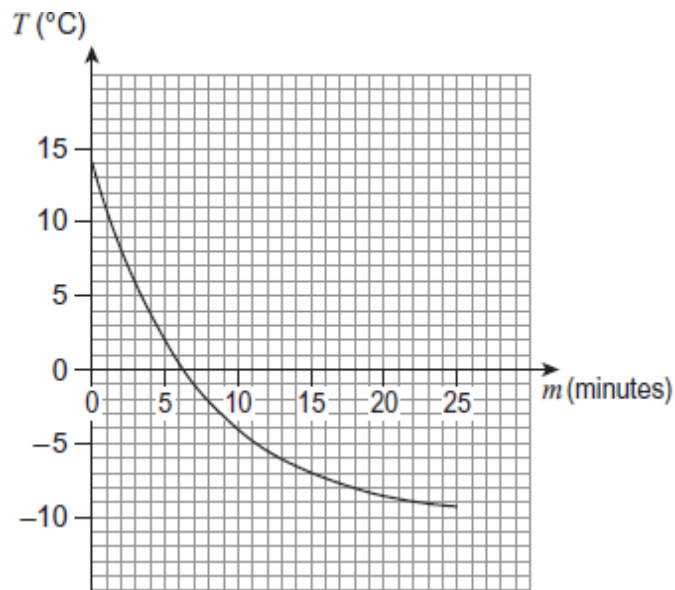
Answer \_\_\_\_\_ m/s<sup>2</sup>

(3)

(Total 7 marks)

**Q5.**

The graph shows the temperature,  $T$  ( $^{\circ}\text{C}$ ) of bread,  $m$  (minutes) after it is placed in a freezer.



(a) How many minutes does it take for the temperature to reach  $0^{\circ}\text{C}$ ?

Answer \_\_\_\_\_ min

(1)

(b) Estimate the rate at which the temperature is decreasing when  $m = 3$   
You **must** show your working.

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Answer \_\_\_\_\_  $^{\circ}\text{C}$  per minute

(3)

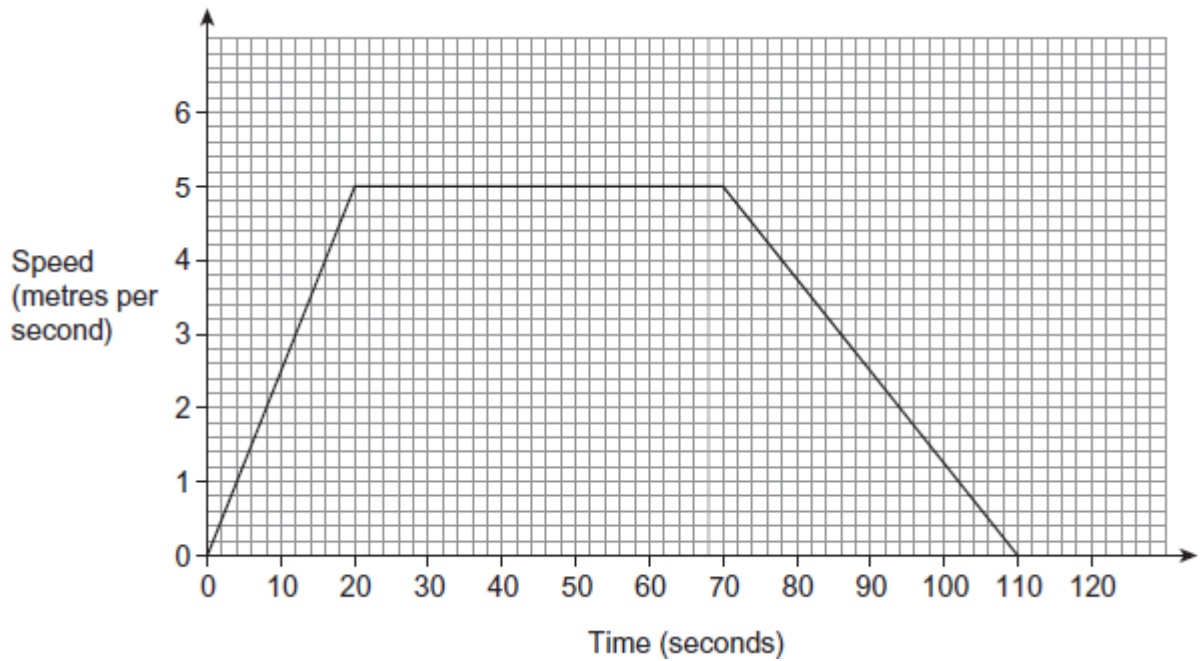
(Total 4 marks)

**Q6.**

The distance around a cycle track is 400 metres.

Robin cycles on the track.

Here is his speed-time graph.



- (a) Show that Robin cycles **exactly** once around the track in 110 seconds.

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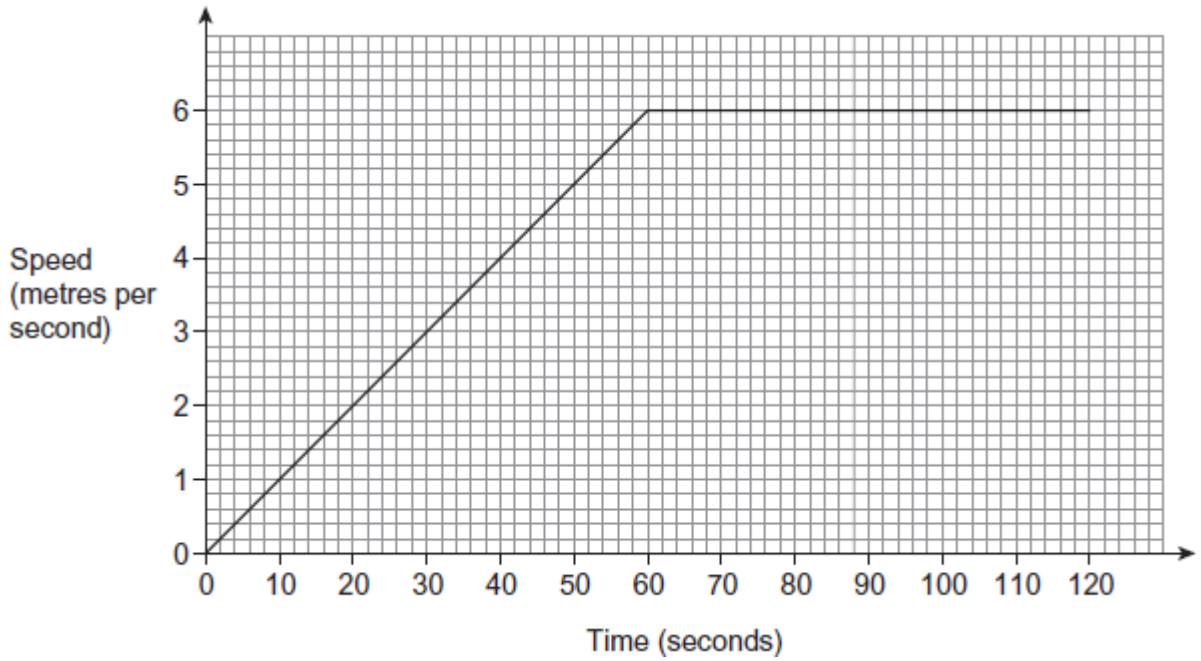
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(2)

(b) Sanjay cycles on the same track.

Here is his speed-time graph.



Does Sanjay cycle the first 400 metres in a quicker time than Robin?  
You **must** show your working.

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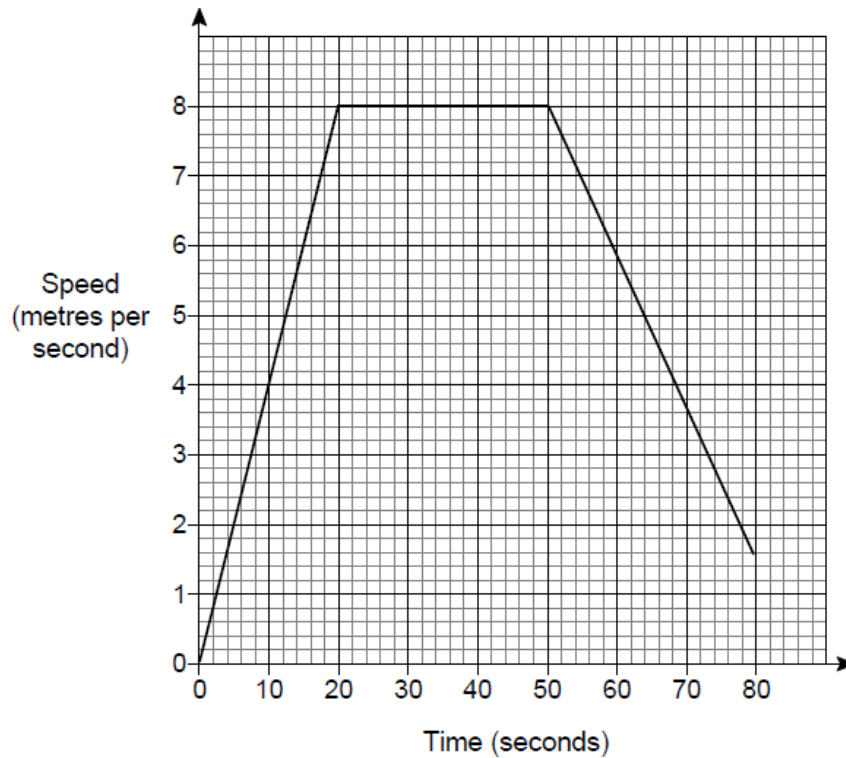
(3)  
(Total 5 marks)



**Q7.**

Amina and Ben had a cycle race.

Here is Amina's speed-time graph from the start of the race.



The distance of the race was 400 metres.

Ben cycled the 400 metres in 64 seconds.

Who won the race?

You **must** show your working.

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Answer \_\_\_\_\_

(Total 4 marks)