UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS **0580/01, 0581/01**

Paper 1 (Core) **May/June 2007**

1 hour

Candidates answer on the Question Paper.

Additional Materials: Electronic Calculator
Geometrical Instruments
Mathematical tables (optional)
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 56.

For Examiner's Use

P

This document consists of **11** printed pages and **1** blank page.

For Examiner's Use

1 Work out the value of $\frac{9 \quad 3\times 7}{3\times 2}$.

Answer [1]

2 Write the following in order, with the smallest first.

$\frac{3}{5}$ 0.58 62%

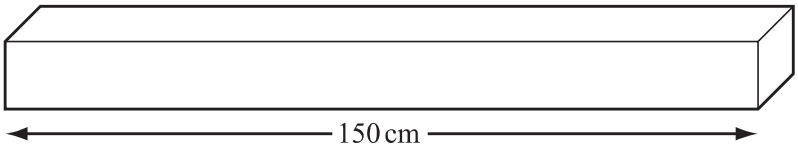
Answer < < [1]

3 Jamal arrived at work at 09 20 and left at 17 15.

How long, in hours and minutes, did he spend at work?

Answer h min [1]

4



NOT TO SCALE

A piece of wood is 150 centimetres long.

It has to be cut into equal lengths of $6\frac{1}{4}$ centimetres.

How many of these lengths can be cut from this piece of wood?

Answer [1]

For Examiner's Use

5 Daniel plots a scatter diagram of speed against time taken.

As the time taken increases, speed decreases.

Which one of the following types of correlation will his scatter graph show?

Positive Negative Zero

Answer [1]

6 The average temperatures in Moscow for each month are shown in the table below.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature °C	−10.2	−8.9	−4.0	4.5	12.2	16.3	18.5	16.6	10.9	4.3	−2.0	−7.5

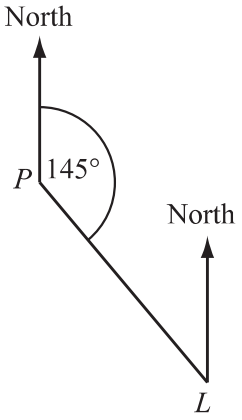
(a) Which month has the lowest average temperature?

Answer(a) [1]

(b) Find the difference between the average temperatures in July and December.

Answer(b) °C [1]

7



NOT TO SCALE

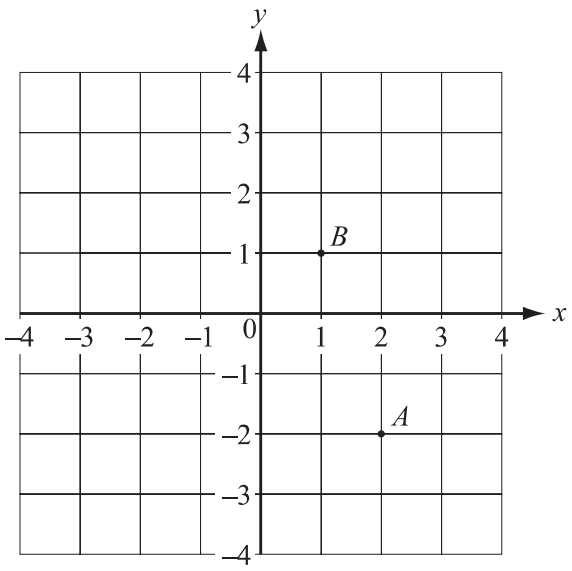
The bearing of a lighthouse, L, from a port, P, is 145°.

Find the bearing of P from L.

Answer [2]

8 The points A and B are marked on the diagram.

For Examiner's Use



(a) Write $\overrightarrow{AB}$ as a column vector.

Answer(a) $\overrightarrow{AB} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(b) $\overrightarrow{BC} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$.

Write down the co-ordinates of C.

Answer(b) (,) [1]

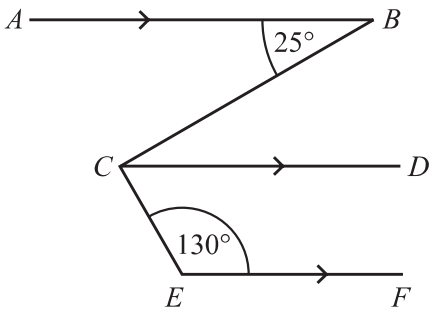
---

9 Expand the brackets and simplify

$$3x^2 - x(x-3y).$$

Answer [2]

10



NOT TO SCALE

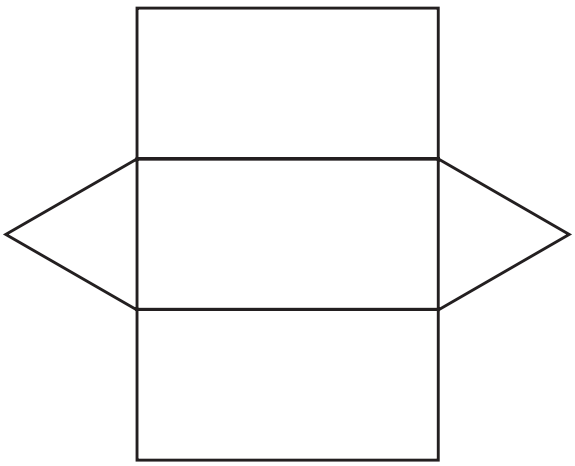
In the diagram, *AB, CD* and *EF* are parallel lines.

Angle *ABC* = 25° and angle *CEF* = 130°.

Calculate angle *BCE*.

Answer Angle BCE = [2]

11 The net of a solid is drawn **accurately** below.



Write down the special name for

(a) the triangles shown on the net,

Answer(a) [1]

(b) the solid.

Answer(b) [1]

For Examiner's Use

12 Write down the equation of the straight line through $(0, -1)$ which is parallel to $y = 3x + 5$.

For Examiner's Use

Answer $y =$ [2]

---

13 **(a)** $4^p \times 4^5 = 4^{15}$. Find the value of p.

Answer(a) $p =$ [1]

(b) $2^7 \div 2^q = 2^4$. Find the value of q.

Answer(b) $q =$ [1]

(c) $5^r = \frac{1}{25}$. Find the value of r.

Answer(c) $r =$ [1]

---

14 **(a)** Alex changed \$250 into euros (€) when the rate was €1 = \$1.19886.

How many euros did he receive?

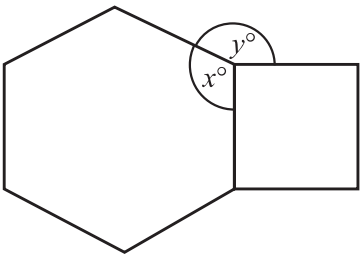
Answer(a) € [2]

(b) Write 1.19886 correct to 3 significant figures.

Answer(b) [1]

For Examiner's Use

15 The diagram shows a regular hexagon and a square.



NOT TO SCALE

Calculate the values of x and y.

Answer x =

y = [3]

---

16 Aminata bought 20 metres of cloth at a cost of \$80.

She sold 15 metres of the cloth at \$5.40 per metre and 5 metres at \$3 per metre.

(a) Calculate the profit she made.

Answer(a) \$ [2]

(b) Calculate this profit as a percentage of the original cost.

Answer(b) % [1]

For Examiner's Use

17 **(a)** The surface area of the earth is approximately 510 000 000 square kilometres.

Write this number in standard form.

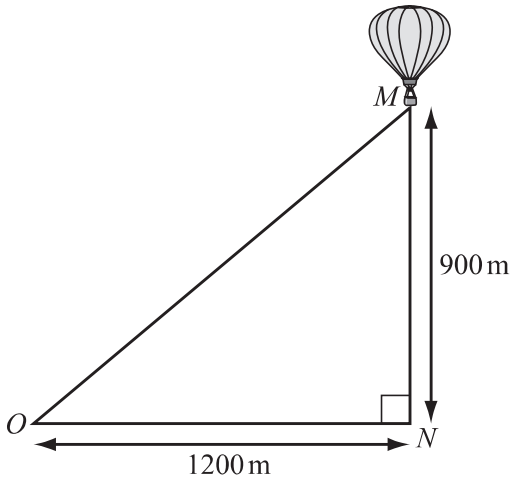
Answer(a) km^2 [2]

(b) 29.4% of the surface area of the earth is land.

Calculate the area of land.

Answer(b) km^2 [2]

18



NOT TO SCALE

A hot air balloon, *M*, is 900 metres vertically above a point *N* on the ground.

A boy stands at a point *O*, 1200 metres horizontally from *N*.

(a) Calculate the distance, *OM*, of the boy from the balloon.

Answer(a) OM = m [2]

(b) Calculate angle *MON*.

Answer(b) Angle MON = [2]

19 In triangle ABC, $AB = 110$ mm, $AC = 65$ mm and $BC = 88$ mm.

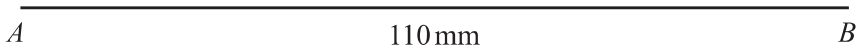
For Examiner's Use

(a) Calculate the perimeter of the triangle ABC.

Answer(a) mm [1]

(b) Construct the triangle ABC, leaving in your construction arcs.

The side AB is drawn for you.



[2]

(c) The side AB is 110 mm, **correct to the nearest millimetre**.

Write down the shortest possible length of AB.

Answer(c) mm [1]

20 15 students estimated the area of the rectangle shown below.

For Examiner's Use

Their estimates, in square centimetres, were

45	44	50	50	48
24	50	46	43	50
48	20	45	49	47

(a) Work out

(i) the mode,

Answer(a)(i) cm^2 [1]

(ii) the mean,

Answer(a)(ii) cm^2 [2]

(iii) the median.

Answer(a)(iii) cm^2 [2]

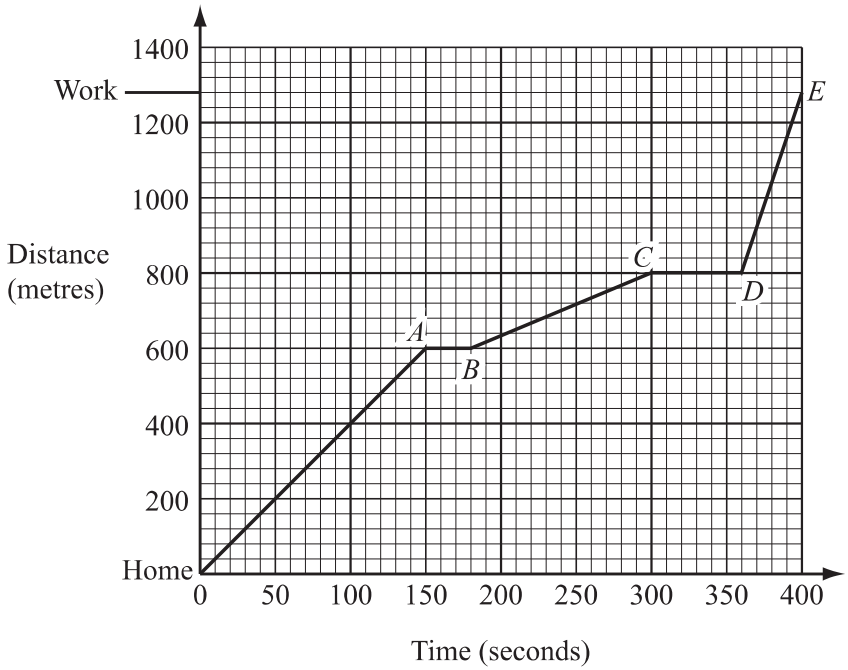
(b) Explain why the mean is not a suitable average to represent this data.

Answer(*b*)

[1]

21

For Examiner's Use



The graph shows the distance travelled by a cyclist on a journey from Home to Work.

(a) The cyclist stopped twice at traffic lights.

For how many seconds did the cyclist wait altogether?

Answer(a) s [2]

(b) For which part of the journey did the cyclist travel fastest?

Answer(b) [1]

(c) **(i)** How far did the cyclist travel from Home to Work?

Answer(c)(i) m [1]

(ii) Calculate the cyclist's average speed for the whole journey.

Answer(c)(ii) m/s [3]

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Q

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UNIVERSITY of CAMBRIDGE International Examinations

For Examiner's Use

1 Work out the value of $\frac{6-3\times12}{3\times2}$.

Answer [1]

2 Write the following in order, with the smallest first.

$\frac{4}{5}$ 0.79 81%

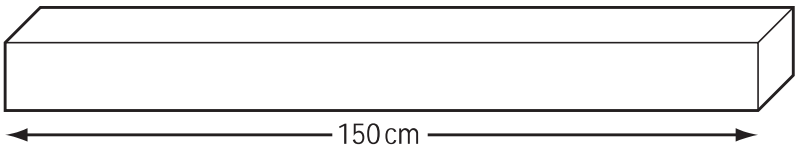
Answer < < [1]

3 Jamal arrived at work at 09 40 and left at 17 25.

How long, in hours and minutes, did he spend at work?

Answer h min [1]

4



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A piece of wood is 150 centimetres long.

It has to be cut into equal lengths of $6\frac{1}{4}$ centimetres.

How many of these lengths can be cut from this piece of wood?

Answer [1]

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5 Daniel plots a scatter diagram of speed against time taken.

As the time taken increases, speed decreases.

Which one of the following types of correlation will his scatter graph show?

Positive Negative Zero

Answer [1]

6 The average temperatures in Moscow for each month are shown in the table below.

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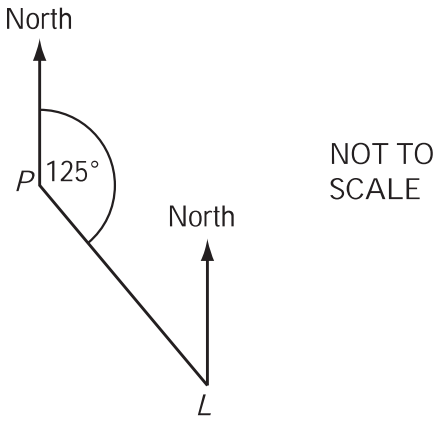
(a) Which month has the lowest average temperature?

Answer(a) [1]

(b) Find the difference between the average temperatures in February and October.

Answer(b) °C [1]

7



The bearing of a lighthouse, L, from a port, P, is 125°.

Find the bearing of P from L.

Answer [2]

For Examiner's Use

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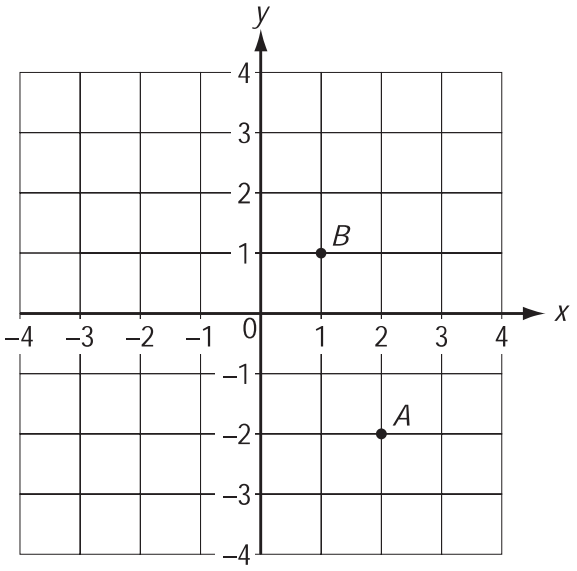


(a) Write $\overrightarrow{AB}$ as a column vector.

Answer(a) $\overrightarrow{AB} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(b) $\overrightarrow{BC} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$.

Write down the co-ordinates of C.

Answer(b) (,) [1]

---

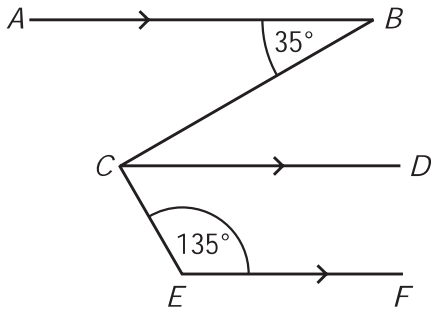
9 Expand the brackets and simplify

$$4x^2 - x(x - 2y).$$

Answer [2]

For Examiner's Use

10



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In the diagram, *AB, CD* and *EF* are parallel lines.

Angle *ABC* = 35° and angle *CEF* = 135°.

Calculate angle *BCE*.

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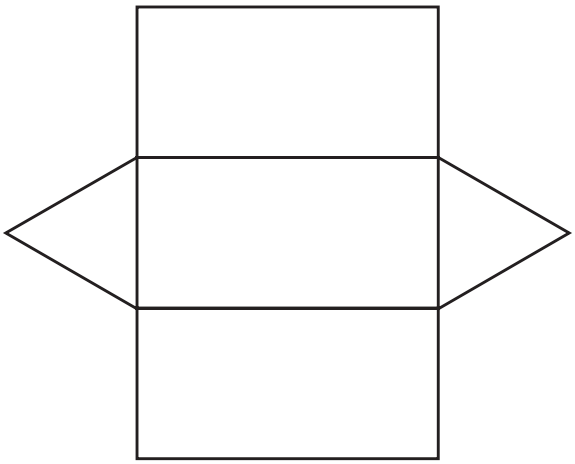

Write down the special name for

(a) the triangles shown on the net,

Answer(*a*) [1]

(b) the solid.

Answer(*b*) [1]

For Examiner's Use

12 Write down the equation of the straight line through $(0, -3)$ which is parallel to $y = 2x + 3$.

Answer $y =$ [2]

---

13 **(a)** $3^p \times 3^5 = 3^{14}$. Find the value of p.

Answer(*a*) $p =$ [1]

(b) $2^8 \div 2^q = 2^3$. Find the value of q.

Answer(*b*) $q =$ [1]

(c) $6^r = \frac{1}{36}$. Find the value of r.

Answer(*c*) $r =$ [1]

---

14 **(a)** Alex changed \$270 into euros (€) when the rate was €1 = \$1.19886.

How many euros did he receive?

Answer(*a*) € [2]

(b) Write 1.19886 correct to 3 significant figures.

Answer(*b*) [1]

For Examiner's Use

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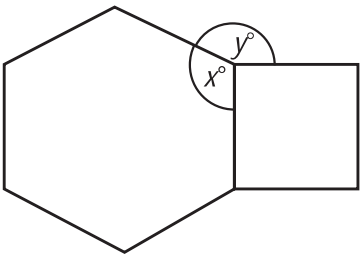


NOT TO SCALE

Calculate the values of x and y.

Answer x =

y = [3]

---

16 Aminata bought 20 metres of cloth at a cost of \$90.

She sold 15 metres of the cloth at \$5.80 per metre and 5 metres at \$3 per metre.

(a) Calculate the profit she made.

Answer (*a*)\$ [2]

(b) Calculate this profit as a percentage of her original cost.

Answer (*b*) % [1]

For Examiner's Use

17 **(a)** The surface area of the earth is approximately 510 000 000 square kilometres.

Write this number in standard form.

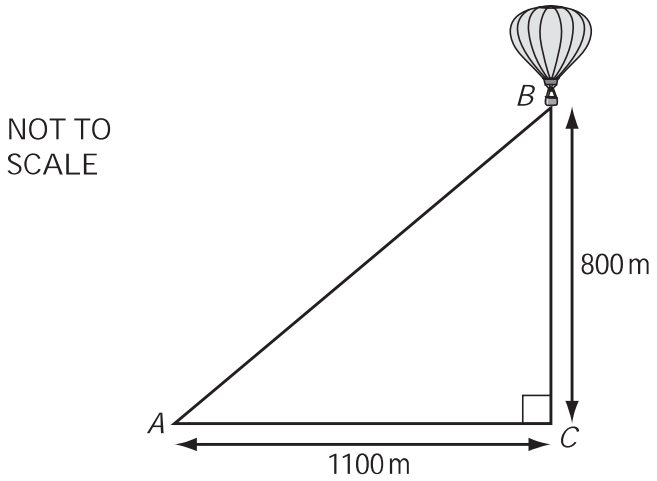
Answer(a) km^2 [2]

(b) 29.4% of the surface area of the earth is land.

Calculate the area of land.

Answer(b) km^2 [2]

18



A hot air balloon, *B*, is 800 metres vertically above a point *C* on the ground.

A girl stands at a point *A*, 1100 metres horizontally from *C*.

(a) Calculate the distance, *AB*, of the girl from the balloon.

Answer(*a*) *AB* = m [2]

(b) Calculate the angle *BAC*.

Answer(*b*) *Angle BAC* = [2]

For Examiner's Use

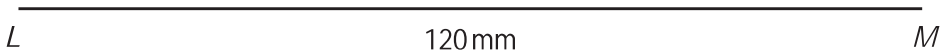
19 In triangle LMN, $LM = 120$ mm, $LN = 70$ mm and $MN = 86$ mm.

(a) Calculate the perimeter of the triangle LMN.

Answer(*a*) mm [1]

(b) Construct the triangle LMN, leaving in your construction arcs.

The side LM is drawn for you.



[2]

(c) The side LM is 120 mm, **correct to the nearest millimetre**.

Write down the shortest possible length of LM.

Answer(*c*) mm [1]

For Examiner's Use

20 15 students estimated the area of the rectangle shown below.

Their estimates, in square centimetres were

45	44	50	50	51
21	50	46	43	50
48	22	45	49	48

(a) Work out

(i) the mode,

Answer(*a*)(i) cm^2 [1]

(ii) the mean,

Answer(*a*)(ii) cm^2 [2]

(iii) the median.

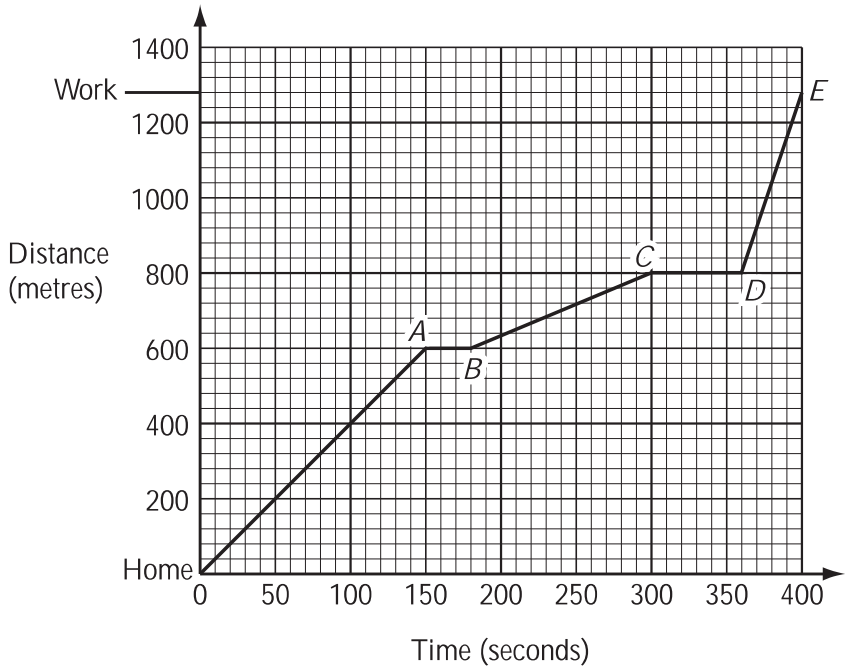
Answer(*a*)(iii) cm^2 [2]

(b) Explain why the mean is not a suitable average to represent this data.
Answer(*b*)

[1]

For Examiner's Use

21



The graph shows the distance travelled by a cyclist on a journey from Home to Work.

(a) The cyclist stopped twice at traffic lights.

For how many seconds did the cyclist wait altogether?

Answer (*a*) s [2]

(b) For which part of the journey did the cyclist travel fastest?

Answer (*b*) [1]

(c) **(i)** How far did the cyclist travel from Home to Work?

Answer (*c*)(i) m [1]

(ii) Calculate the cyclist's average speed for the whole journey.

Answer(*c*)(ii) m/s [3]

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