Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0583174967

MATHEMATICS **0580/33**

Paper 3 (Core) **May/June 2015**

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Tracing paper (optional)
Geometrical instruments

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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, 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 104.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **16** printed pages.

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CAMBRIDGE International Examinations

1 **(a)** The number of trains stopping each day, for 20 days, at Pherlak Station is recorded below.

15 14 16 14 13 13 12 15 16 15

14 13 14 13 13 12 11 12 10 10

(i) Complete the table to show the frequency of the number of trains stopping each day.

Number of trains stopping each day	Tally	Frequency
10		
11		
12		
13		
14		
15		
16		

[2]

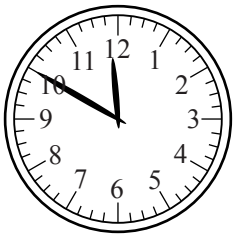
(ii) Write down the modal number of trains stopping each day.

Answer(a)(ii) ..... [1]

(iii) Work out the mean number of trains stopping each day.

Answer(a)(iii) ..... [2]

(iv) The time of the last train to leave one night is shown on this clock.

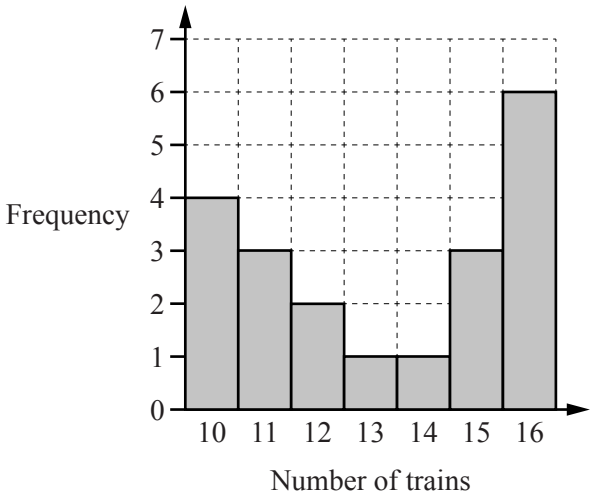


Write down this time using the 24-hour clock.

Answer(a)(iv) ..... [1]

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(b) This bar chart shows the number of trains stopping each day, for 20 days, at Sparke Station.



(i) Write down the modal number of trains stopping each day at Sparke Station.

Answer(b)(i) ..... [1]

(ii) Write down the range of the number of trains stopping each day at Sparke Station.

Answer(b)(ii) ..... [1]

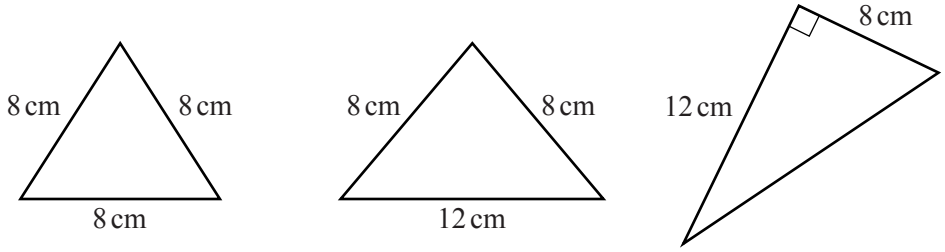
(iii) Write one comment comparing the number of trains stopping each day at Pherlak Station to those stopping at Sparke Station.

Answer(b)(iii) .....

.....

..... [1]

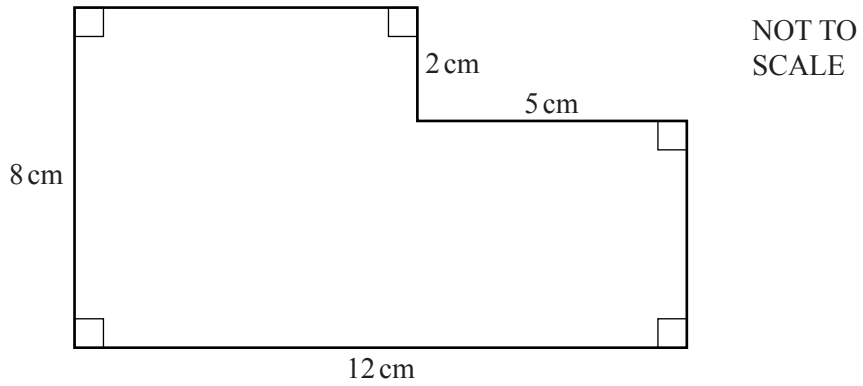
2 **(a)** Write the mathematical name under each of these triangles.



....

[3]

(b)



(i) Find the perimeter of this shape.

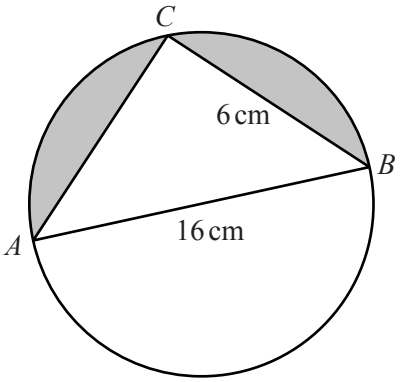
Answer(b)(i) ..... cm [1]

(ii) Find the area of this shape.
Give the units of your answer.

Answer(b)(ii) .... [3]

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(c)



NOT TO SCALE

In the diagram AB is the diameter of the circle and C is a point on the circumference.
$AB = 16$ cm and $BC = 6$ cm.

(i) Give a reason why angle $ACB = 90°$.

Answer(c)(i) .....

..... [1]

(ii) Calculate AC.

Answer(c)(ii) $AC =$ ..... cm [3]

(iii) Calculate the shaded area.

Answer(c)(iii) .....cm^2 [5]

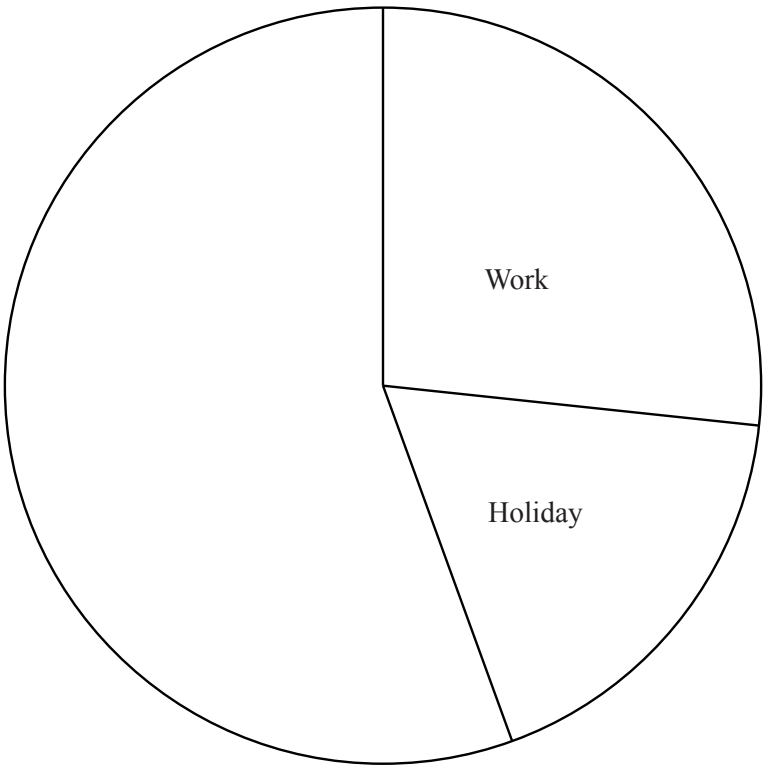
3 One day Raphael asked 90 people at a station the reason for their train journey.

(a) (i) Complete the table which shows the angles for the sectors in a pie chart.

Reason	Frequency	Angle
Work	24	96°
Holiday	16	64°
Shopping	19	
Other	31	

[2]

(ii) Complete the pie chart to show this information.



[1]

(b) Raphael selects one person at random.

Write down the probability that this person is going to work.
Give your answer as a fraction in its simplest form.

Answer(b) ..... [2]

(c) 405 people used the station that day.

Using Raphael's information, calculate how many of the 405 people are likely to be going on holiday.

Answer(c) ..... [2]

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4 In triangle ABC, $AC = 10$ cm and $BC = 9$ cm.

(a) **Using a ruler and compasses only**, construct this triangle below.
AB has been drawn for you.



[2]

(b) **Using a straight edge and compasses only**, construct the bisector of angle ABC.
Continue the bisector until it meets the line AC at D.
Mark the point D on your diagram. [2]

(c) Measure BD.

Answer(c) $BD =$ ..... cm [1]

(d) Your diagram shows the positions of three towns A, B and C on a map.
A is due North of B.

Measure the bearing of C from A.

Answer(d) ..... [1]

5 Indira makes a playground for children.

(a) She borrows \$40 000 for 5 years at a rate of 3.6% per year simple interest.

Calculate the total amount she will owe at the end of 5 years.

Answer(a) \$ ..... [3]

(b) Bandhura works at the playground for 28 hours.
She is paid \$15.85 per hour.

Calculate the total amount Bandhura is paid.

Answer(b) \$ ..... [1]

(c) To visit the playground each adult pays \$1.25 and each child pays \$3.50 .
One day 24 adults and 32 children visit the playground.

Calculate how much they pay altogether.

Answer(c) \$ ..... [3]

(d) On another day 180 people visit the playground.
These people are in the ratio

adults : boys : girls = 3 : 2 : 7.

Calculate the numbers of adults, boys and girls.

Answer(d) Adults = ...

Boys = ...

Girls = ... [3]

(e) The opening hours for the playground are shown below.

Monday	Closed
Tuesday	08 30 to 17 15
Wednesday	08 30 to 17 15
Thursday	08 30 to 17 15
Friday	08 30 to 18 00
Saturday	08 30 to 17 15
Sunday	09 00 to 17 00

Calculate the total number of hours that the playground is open in the week.

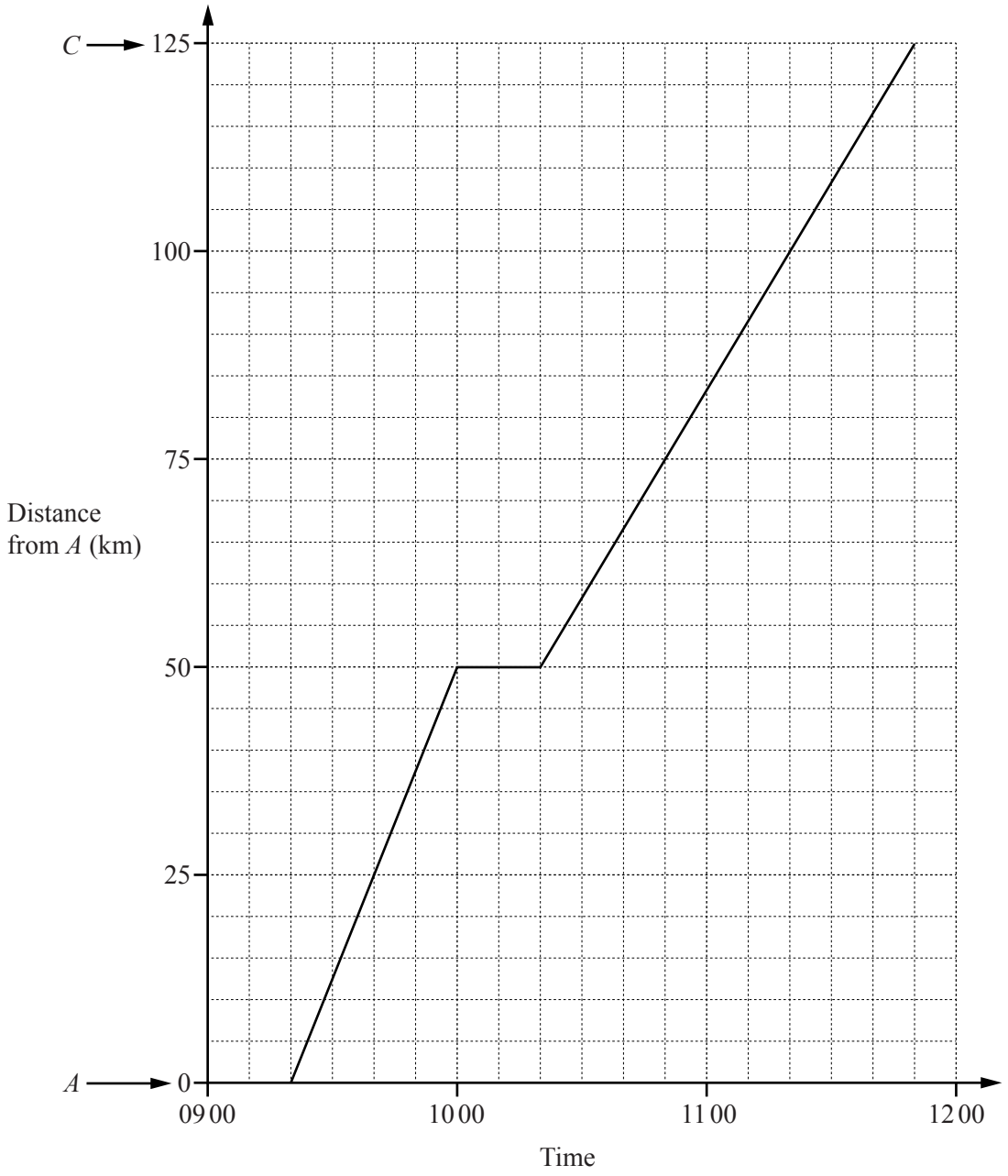
Answer(e) ..... hours [2]

(f) Indira introduces a family ticket for $7.95 .
21 families buy this ticket.

By rounding both numbers to 1 significant figure, **estimate** how much Indira receives.
Show clearly how you worked out your estimate.

Answer(f) $ ..... [2]

6 The travel graph shows a journey of a train from *A* to *C*, stopping at *B*.



(a) Write down the time that the train leaves *A*.

Answer(a) ..... [1]

(b) Write down the time that the train stops at *B*.

Answer(b) ..... [1]

(c) For how many minutes did the train stop at *B*?

Answer(c) ..... min [1]

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(d) Work out the average speed of the train between *A* and *C*.

Answer(d) ..... km/h [3]

(e) Another train leaves *C* at 09 50 and arrives at *A* at 11 40 without stopping.
It travels at a constant speed.

(i) On the grid, draw the travel graph for this train. [1]

(ii) At what time do the two trains pass each other?

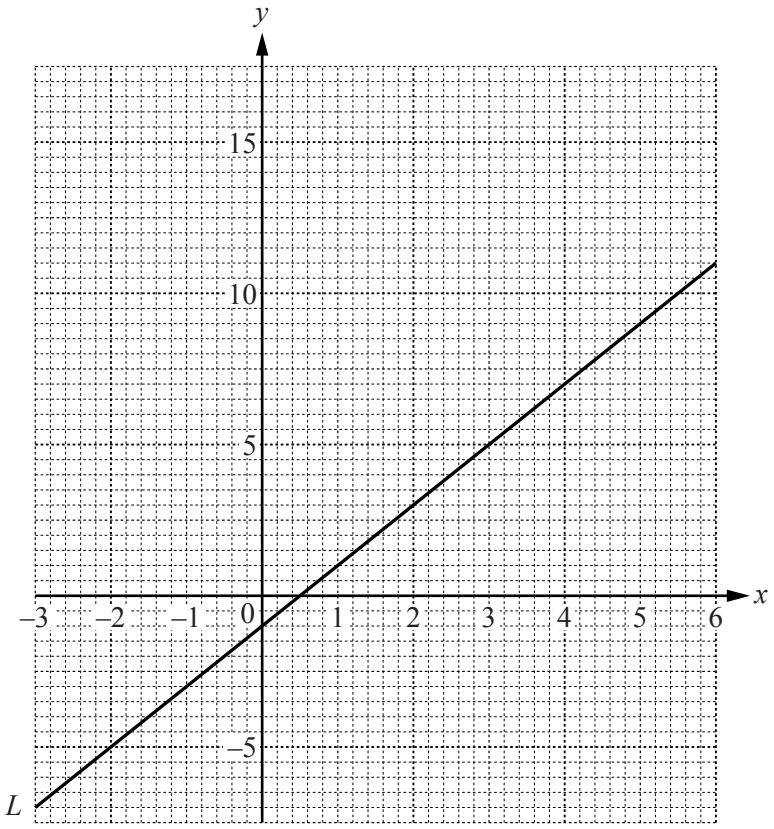
Answer(e)(ii) ..... [1]

(f) A ticket from *A* to *C* costs 2345 rupees.
The exchange rate is 1 rupee = $0.024 .

Calculate the cost of the ticket in dollars.

Answer(f) $ ..... [1]

7 **(a)** The grid below shows the straight line L.



The equation of the line L is $y = 2x + c$.

Find the value of c.

Answer(a) $c =$..... [1]

(b) **(i)** Complete the table of values for $y = x^2 - 3x - 2$.

x	–3	–2	–1	0	1	2	3	4	5	6
y		8	2		–4	–4		2	8	

[2]

(ii) On the grid, draw the graph of $y = x^2 - 3x - 2$ for $-3 \leqslant x \leqslant 6$. [4]

(iii) Write down the values of x where the line L intersects the curve $y = x^2 - 3x - 2$.

Answer(b)(iii) $x =$ ..... and $x =$ ..... [2]

8 **(a)** **(i)** $A = 4\pi r^2$

Work out the value of A when $r = 5.6$.
Give your answer correct to 1 decimal place.

Answer(a)(i) $A =$ ..... [2]

(ii) Simplify the expression.

$$2a - b + 5a - 3b$$

Answer(a)(ii) ..... [2]

(iii) Solve the equation.

$$\frac{x}{3} = 6$$

Answer(a)(iii) $x =$ ..... [1]

(iv) Solve the equation.

$$x - 2 = 9$$

Answer(a)(iv) $x =$ ..... [1]

(b) Solve the simultaneous equations.
You must show all your working.

$$2x + 3y = 4$$
$$3x - 4y = 23$$

Answer(b) $x =$ .....

$y =$ ..... [4]

9 **(a)** Here are the first four terms of a sequence.

5 8 11 14

(i) Write down the next term in this sequence.

Answer(a)(i) ..... [1]

(ii) Write down the rule for finding the next term of this sequence.

Answer(a)(ii) ..... [1]

(iii) Find an expression for the nth term of this sequence.

Answer(a)(iii) ..... [2]

(iv) Explain why the number 300 is not in this sequence.

Answer(a)(iv) ..... [1]

(b) Here are the first four terms of another sequence.

4 7 11 16

(i) Write down the next two terms in this sequence.

Answer(b)(i) ..... , ... [2]

(ii) Write down the rule for continuing this sequence.

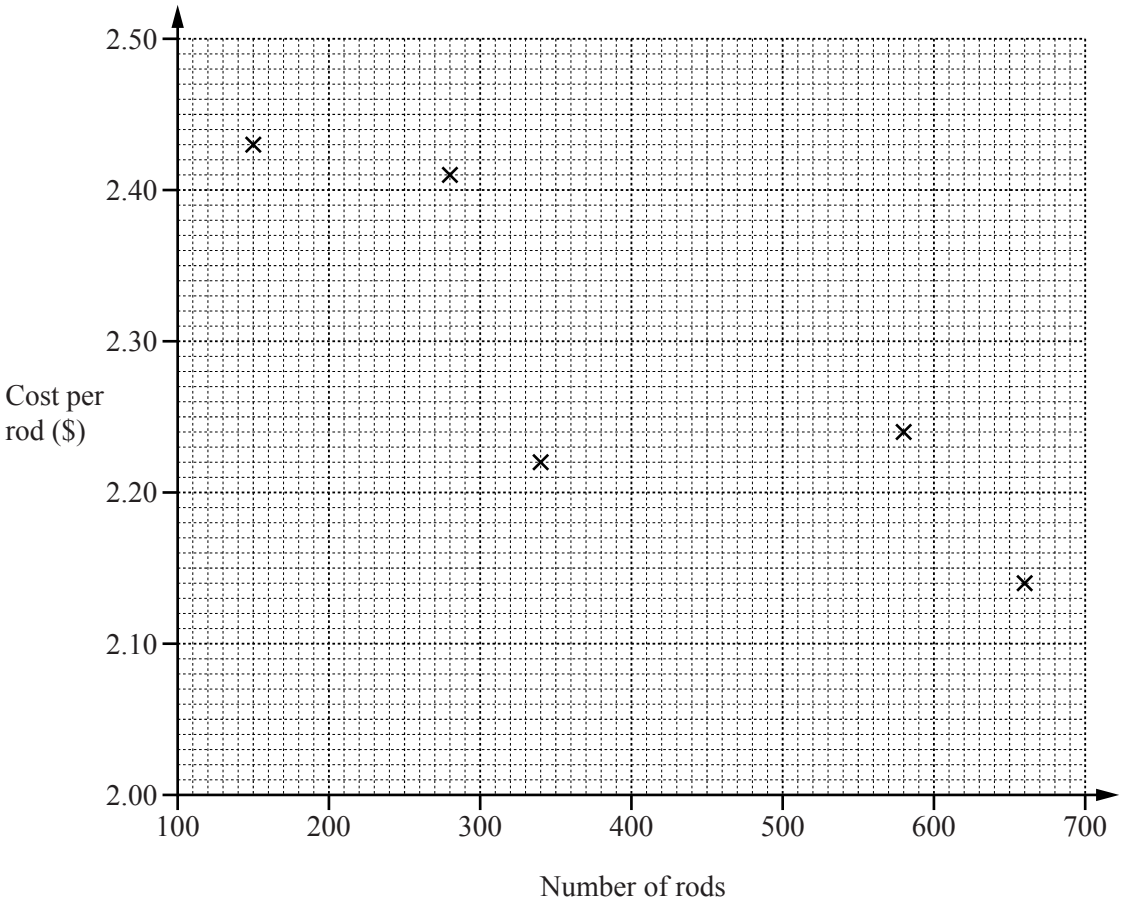
Answer(b)(ii) ..... [1]

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10 A manufacturer makes rods.
Each day he records the number of rods made and the cost, in dollars, of making each rod.

Number of rods	660	340	150	580	280	520	310	480
Cost per rod ($)	2.14	2.22	2.43	2.24	2.41	2.18	2.30	2.28

(a) Complete the scatter diagram.
The first five points have been plotted for you.



[2]

(b) Draw a line of best fit. [1]

(c) What type of correlation is shown by the scatter diagram?

Answer(c) ..... [1]

(d) When 400 rods are made, use your line of best fit to estimate the cost of each rod.

Answer(d) $ ..... [1]

(e) On another day the cost per rod is $2.20 .

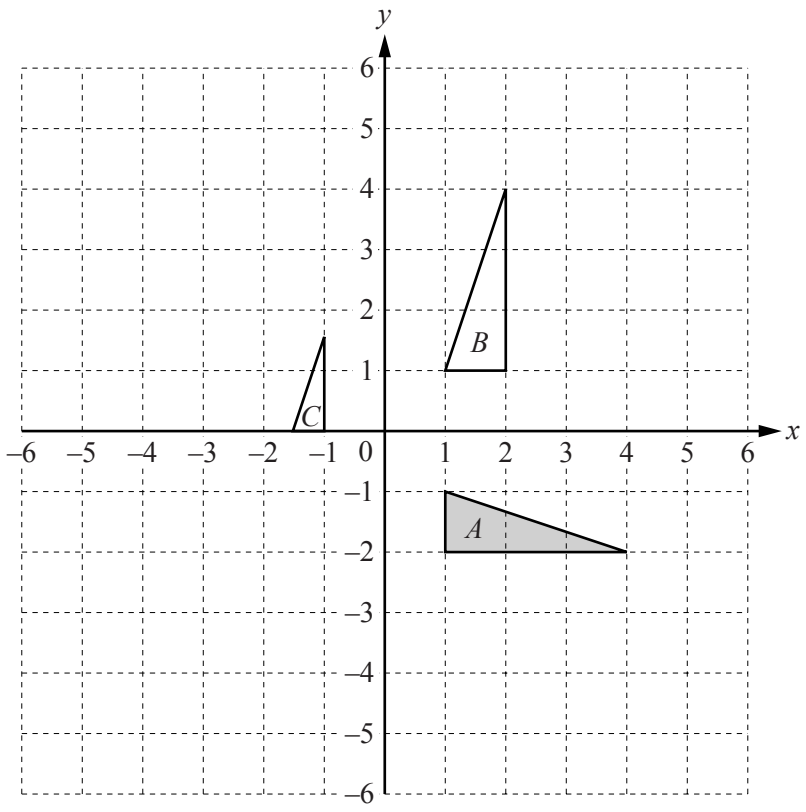
Estimate the number of rods made.

Answer(e) ..... [1]

Question 11 is printed on the next page.

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11



(a) Reflect triangle A in the line $y = -3$. [2]

(b) Translate triangle A by the vector $\begin{pmatrix} -5 \\ 4 \end{pmatrix}$. [2]

(c) Describe fully the **single** transformation that maps

(i) triangle A onto triangle B,

Answer(c)(i) .....

..... [3]

(ii) triangle C onto triangle B.

Answer(c)(ii) .....

..... [3]

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