Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **0580/33**

Paper 3 (Core) **October/November 2016**

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)** Juan takes his car to a garage for repairs.

View solution

Complete his bill.

Item	Price ($)
Service	475.00
3 tyres at $86 each	.....
4.5 litres of oil at $5.68 per litre	.....
Total	.....

[3]

(b) Juan buys a van costing $4400.
He pays a deposit of $3740.

View solution

(i) Work out $3740 as a percentage of $4400.

..... % [1]

(ii) He borrows the rest of the money for one year at a rate of 12% per year simple interest.

View solution

Work out how much he pays back at the end of one year.

$..... [3]

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(c) Juan pays $321 for insurance.
He makes 12 equal payments.

View solution

Work out each payment.

$..... [1]

(d) Juan's car travels 12.4 km and uses 1 litre of fuel.
His van travels 1 km and uses 0.0792 litres of fuel.

View solution

Using 1 litre of fuel, which vehicle travels further?
Explain how you decide.

..... travels further because .....

..... [2]

(e) In 2015 the total cost of repairs and fuel for his van was $4200.
These costs are in the ratio repairs : fuel = 1 : 2.

View solution

Find the cost of the fuel.

$..... [2]

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2 Eight athletes compete in both the 200 metre race and the long jump.
Their results are shown in the table.

Time for 200 m (seconds)	23.85	23.91	23.92	23.96	24.02	24.15	24.23	24.30
Distance in the long jump (metres)	6.42	6.32	6.24	6.18	6.05	5.97	5.90	5.84

(a) (i) Work out the range of the times for the 200 metre race.

View solution

..... s [1]

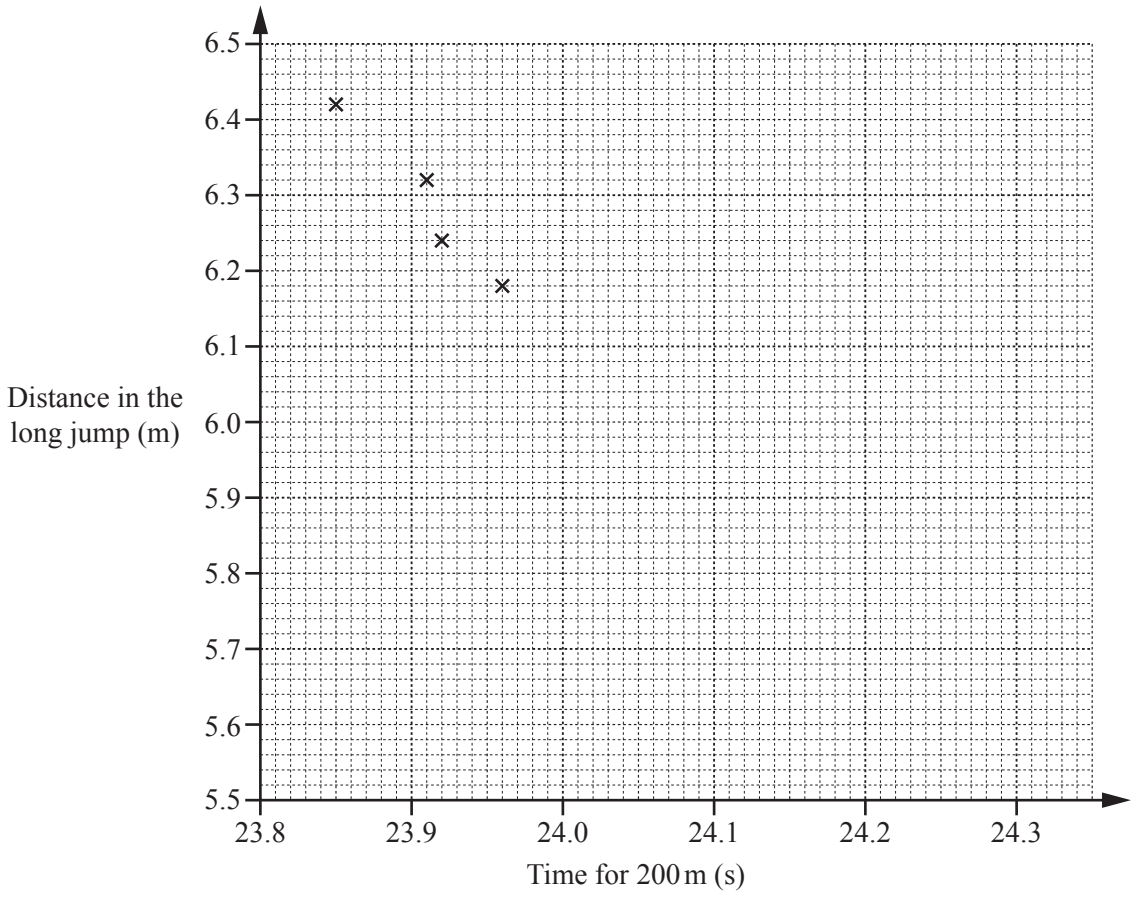
(ii) Work out the mean of the distances in the long jump.

View solution

..... m [2]

(b) (i) Complete the scatter diagram.
The first four points have been plotted for you.

View solution



[2]

(ii) What type of correlation is shown on the scatter diagram?

..... [1]

(iii) Joe says that the scatter diagram shows that the faster an athlete runs the 200 metre race the shorter their distance in the long jump.

Is he correct?
Explain your answer.

..... because .....

..... [1]

(iv) Draw a line of best fit on the scatter diagram. [1]

(v) Jessica's time for the 200 metre race is 24.05 s.

Use your line of best fit to estimate her distance in the long jump.

..... m [1]

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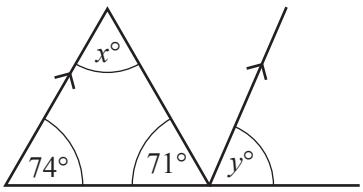
3 **(a)**



NOT TO SCALE

View solution

Work out the value of

(i) x,

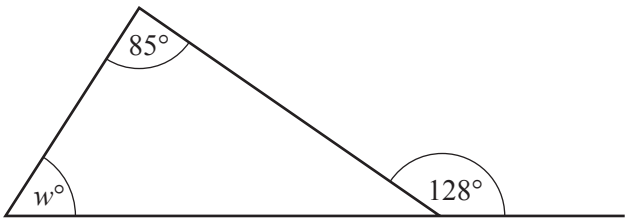
$x =$ ..... [1]

(ii) y.

View solution

$y =$ ..... [1]

(b)



NOT TO SCALE

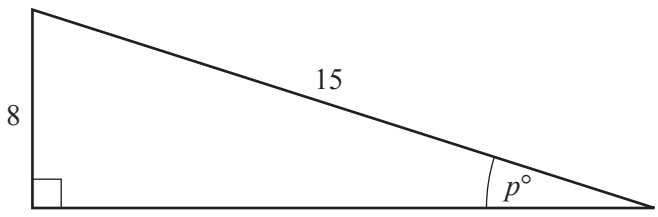
View solution

Work out the value of w.
Give reasons for your answer.

$w =$ ..... because .....

..... [3]

(c)



NOT TO SCALE

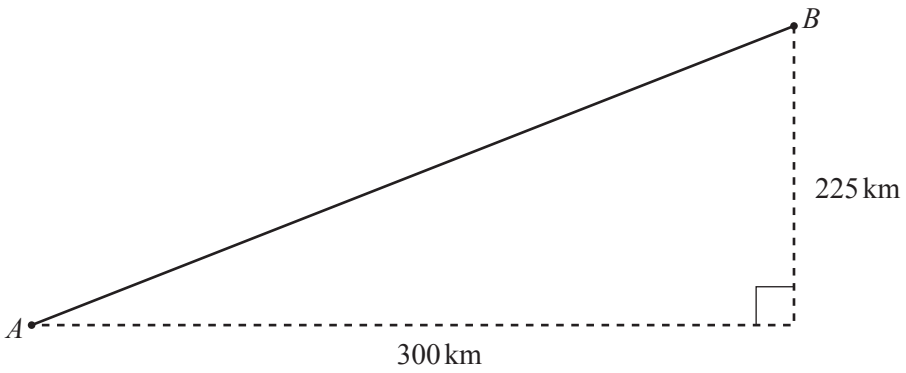
View solution

Use trigonometry to calculate the value of p.

$p =$ ..... [2]

(d)

View solution



NOT TO SCALE

The diagram shows the path of a plane from airport A to airport B.

(i) Show that the distance between A and B is 375 km.

[2]

View solution

(ii) The plane flies at an average speed of 450 km/h.
It leaves A at 14 45 and flies directly to B.

Work out the time it arrives at B.

..... [4]

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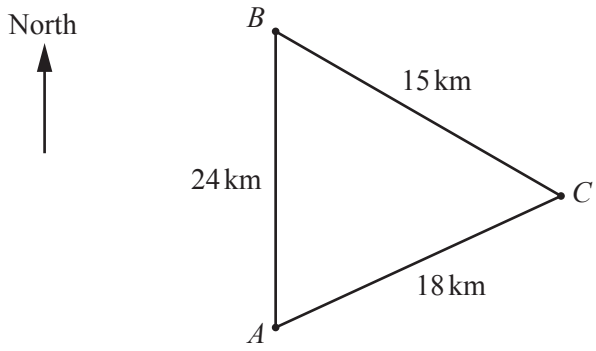
4 **(a)** The diagram shows the positions of three towns, A, B and C.
B is 24 km due North of A.
C is 18 km from A and 15 km from B.

View solution



NOT TO SCALE

(i) **Using a ruler and compasses only**, construct a scale drawing to show the positions of B and C.
Town A has been marked for you.
Use a scale of 1 centimetre to represent 3 kilometres.



A •

Scale: 1 cm to 3 km

[3]

(ii) Using your scale drawing, measure the bearing of C from A.

View solution

..... [1]

(iii) Town D is on a bearing of 023° from town A.

Work out the bearing of town A from town D.

View solution

..... [2]

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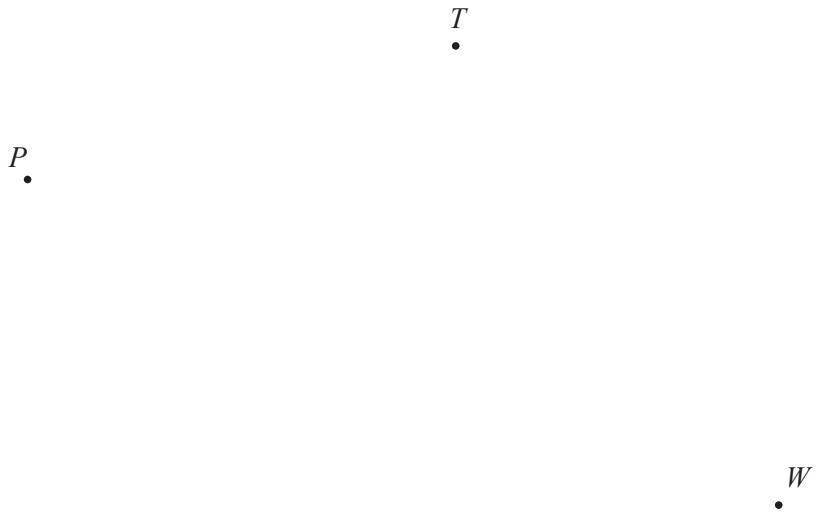
(b) The scale drawing shows the positions of three ports P, T and W.
A ship, S, is

- the same distance from P and T
- 300 km from W.

Using a ruler and compasses only, construct and mark the **two** possible positions of the ship.
Use a scale of 1 centimetre to represent 50 kilometres.

View solution



Scale: 1 cm to 50 km

[5]

5 **(a)** **(i)** Write down the two square numbers between 50 and 99.

View solution

..... and ..... [2]

(ii) Find a common multiple of 30 and 45.

View solution

..... [1]

(iii) Write down all the factors of 54 that are odd numbers.

View solution

..... [2]

(iv) Find the highest common factor (HCF) of 64 and 80.

View solution

..... [2]

(b) **Without using your calculator**, work out $1\frac{5}{6} \div \frac{2}{5}$.
Write down all the steps in your working and write your answer as a mixed number.

View solution

..... [4]

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(c) For each of these sequences, write down the next term and the rule for continuing the sequence.

View solution

(i) 8, 11, 14, 17, …

Next term is .....

The rule is ..... [2]

View solution

(ii) 25, 17, 9, 1, …

Next term is .....

The rule is ..... [2]

View solution

(iii) 2, 4, 7, 11, …

Next term is .....

The rule is ..... [2]

View solution

(iv) 1, 8, 27, 64, …

Next term is .....

The rule is ..... [2]

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6 **(a)** A regular hexagon has side length h.

Write down an expression, in terms of h, for the perimeter of the hexagon.

View solution

..... [1]

(b) A square has side length x.

View solution

Write down an expression, in terms of x, for

(i) the perimeter of the square,

..... [1]

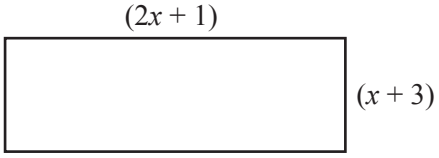
(ii) the area of the square.

View solution

..... [1]

(c) In this part, all measurements are in centimetres.

View solution



NOT TO SCALE

A rectangle has length $(2x + 1)$ and width $(x + 3)$.
The perimeter of the rectangle is 53.

Work out the value of x.

$x =$ ..... [5]

(d) Simplify.

$5a + 4b - 2a - b + 3a - 2b$

View solution

..... [2]

(e) Multiply out the brackets.

View solution

(i) $5(x - 4)$

..... [1]

(ii) $x(x^2 + 3)$

View solution

..... [2]

(f) Factorise completely.

$8x^2 - 4x$

View solution

..... [2]

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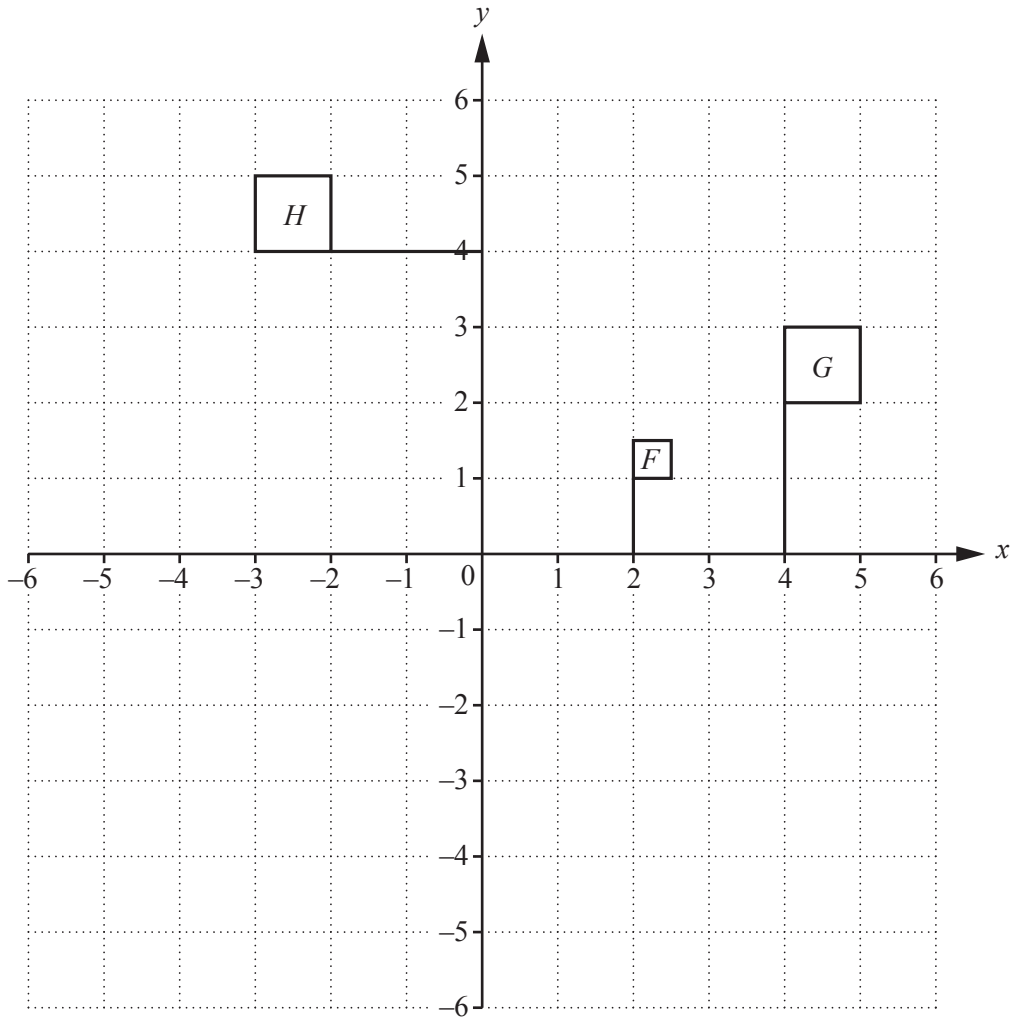
7



View solution

(a) Reflect flag H in the x-axis. [1]

View solution

(b) Translate flag G by the vector $\begin{pmatrix} 1 \\ -3 \end{pmatrix}$. [2]

(c) Describe fully the **single** transformation that maps flag G onto flag H.

View solution

.....

..... [3]

(d) Describe fully the **single** transformation that maps flag F onto flag G.

View solution

.....

..... [3]

8 **(a)** Complete the table of values for $y = x^2 - 2x$.

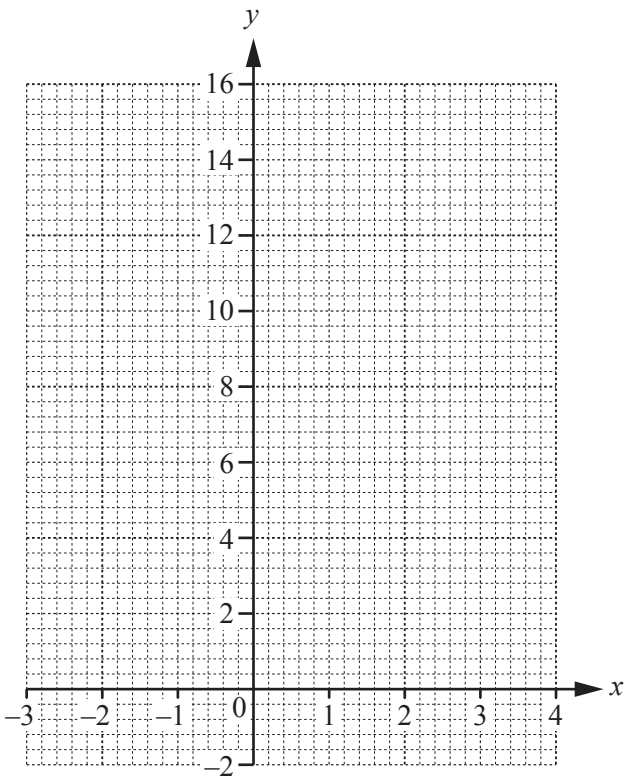
View solution

x	-3	-2	-1	0	1	2	3	4
y			3		-1		3	

[3]

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

View solution



[4]

(c) On the grid, draw the line $y = 6$. [1]

View solution

(d) Use your graph to solve the equation $x^2 - 2x = 6$.
Give your answers correct to 1 decimal place.

View solution

$x =$ ..... or $x =$ ..... [2]

Question 9 is printed on the next page.

9 **(a)** Here is a list of ingredients to make 18 chocolate chip biscuits.

View solution

butter	130 g
sugar	60 g
flour	180 g
chocolate chips	30 g

Work out how much of each ingredient you need to make 45 biscuits.

butter ..... g

sugar ..... g

flour ..... g

chocolate chips ..... g [3]

(b) In a recipe for bread, $\frac{5}{8}$ of the mass of bread mixture is flour.
Paul uses 395 g of flour.

View solution

(i) What mass of bread mixture does he make?

..... g [2]

(ii) Write your answer to **part(b)(i)** in kilograms.

View solution

..... kg [1]

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