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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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5413394739

MATHEMATICS **0581/33**

Paper 3 (Core) **May/June 2010**

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Mathematical tables (optional)
Geometrical instruments
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 104.

This document consists of **12** printed pages.

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For
iner's

1 A bookshop sold a total of 2750 books in January.

(a) The ratio hardback books sold : paperback books sold was 4 : 7.
Calculate how many paperback books were sold.

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

(b) 24% of the 2750 books sold were non-fiction.
Calculate how many non-fiction books were sold.

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

(c) 330 cookery books were sold.
Write 330 as a fraction of 2750 in its lowest terms.

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

(d) In February, the bookshop sold 14% more than the 2750 books sold in January.
Calculate the number of books sold in February.

Answer(d) ..... [3]

(e) The total value of the books sold in January was \$9480 correct to the nearest 10 dollars.
Write down the lower bound for this amount.

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

(f) 35000 books were sold in a year.
Write this number in standard form.

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

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2 **(a)** Write down

(i) five numbers which are multiples of 7,

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

(ii) two common multiples of 4 and 7.

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

(b) 10 12 13 16 17 23 25 39

From the list above, write down

(i) a square number that is also an odd number,

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

(ii) a prime number that is one more than a square number.

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

(c) n is an integer and n^3 is between 60 and 70.
Find the value of n.

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

(d) k and m are prime numbers.

$$k^2 + m = 23$$

Find k and m.

Answer(d) $k =$ .....

$m =$ ..... [2]

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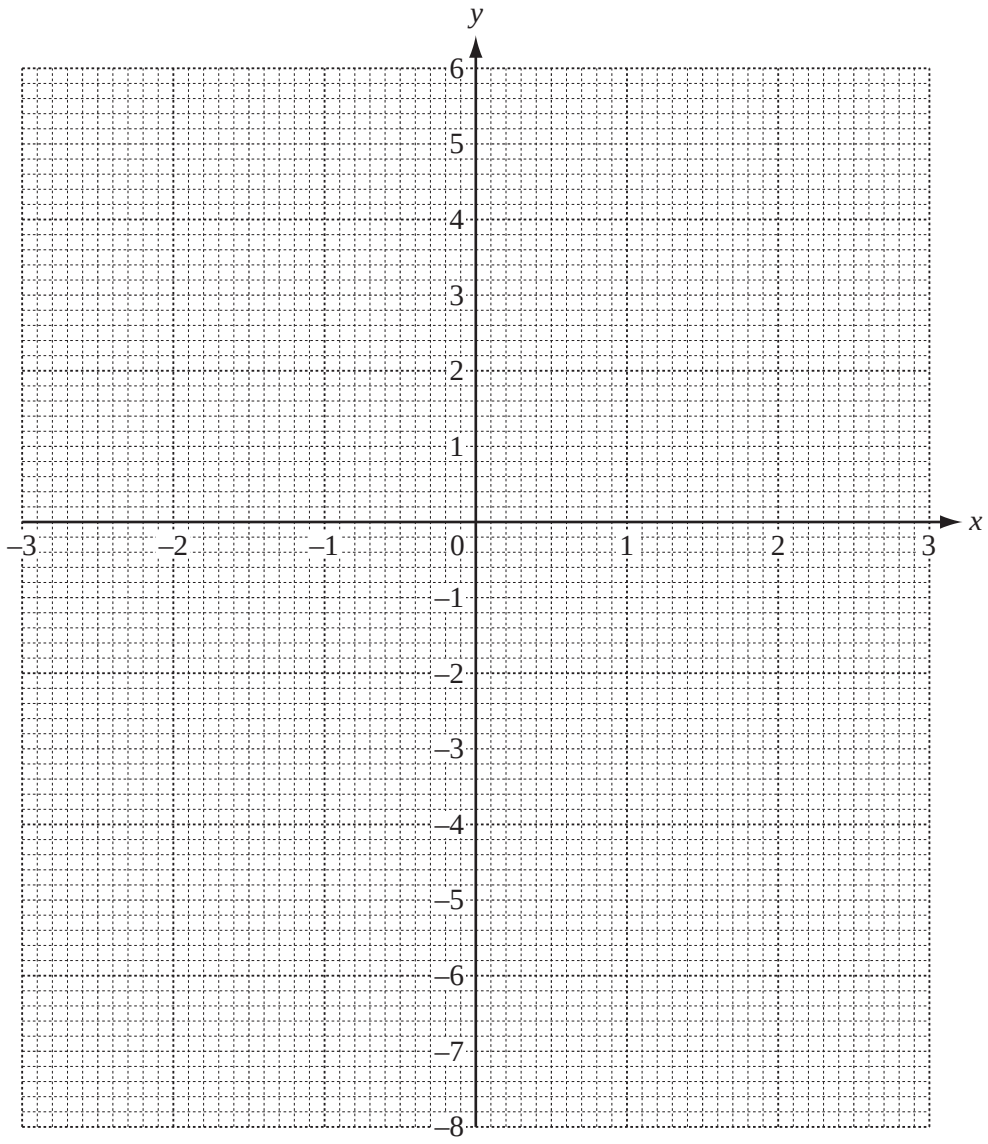
iner's

3 **(a)** Complete the table of values for $y = 5 + x - x^2$.

x	–3	–2	–1	0	1	2	3
y	–7	–1		5		3	

[3]

(b) On the grid below draw the graph of $y = 5 + x - x^2$ for $-3 \leqslant x \leqslant 3$.



[4]

(c) Use your graph to solve the equation $5 + x - x^2 = 2$.

Answer(c) $x =$ ..... or $x =$ ..... [2]

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(d) **(i)** Complete the table of values for $y = 2x - 1$.

x	–3	0	3
y			

[2]

(ii) On the grid, draw the straight line $y = 2x - 1$ for $-3 \leqslant x \leqslant 3$. [2]

(iii) Write down the gradient of $y = 2x - 1$.

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

(e) Write down the co-ordinates of the points where the line $y = 2x - 1$ intersects the graph of $y = 5 + x - x^2$.

Answer(e) (..... , ...) and (..... , ...) [2]

---

4 **(a)** Solve the equation.

$$3(x + 1) + 5(x - 3) = 48$$

Answer(a) $x =$ ..... [3]

(b) Make f the subject of the formula $g = 7f - 5$.

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

(c) Factorise **completely** $6xy - 10yz$.

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

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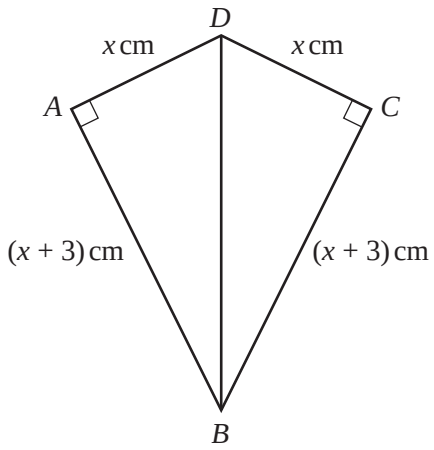
5



NOT TO SCALE

Triangles *DAB* and *DCB* form a kite *ABCD*.
Angle *DAB* = angle *DCB* = 90°.
AD = *DC* = *x* cm and *AB* = *BC* = (*x* + 3) cm.

(a) Complete the following statement.

Triangle *ADB* is ..... to triangle *CDB*. [1]

(b) **When $x = 8$**, calculate angle *DBC*.

Answer(b) Angle *DBC* = ... [2]

(c) **When $x = 5$**, calculate

(i) the area of triangle *BCD*,

Answer(c)(i) ..... cm^2 [2]

(ii) the area of the kite *ABCD*.

Answer(c)(ii) ..... cm^2 [1]

(d) For a **different** value of *x*, the perimeter of the kite is 62 cm.

Write down and solve an equation to find this value of *x*.

Answer(d) *x* = ... [3]

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6 In triangle ABC, $BC = 9$ cm and $AC = 11$ cm.
The side AB has been drawn for you.

(a) Using ruler and compasses only, complete the triangle ABC. [2]

(b) Measure and write down the size of angle CAB.

Answer(b) Angle CAB = ... [1]

(c) **For the constructions below, use a straight edge and compasses only.**
Leave in all your construction arcs.

(i) Construct the bisector of angle ABC.
Label the point P where the bisector crosses AC. [2]

(ii) Construct the locus of points which are equidistant from A and from C.
Label the point Q where the locus crosses AC. [2]

(d) **(i)** Write down the length of PQ in centimetres.

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

(ii) Shade the region inside the triangle which is nearer to AB than to BC
and nearer to C than to A. [1]

(e) Triangle ABC is a scale drawing.
The 9 cm line, BC, represents a wall 45 metres long.
The scale of the drawing is $1 : n$.
Find the value of n.

Answer(e) n = ... [2]

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7 **(a)** The first four terms of a sequence are given below.

5 9 13 17

Write down

(i) the next term,

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

(ii) the 8th term,

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

(iii) an expression, in terms of n, for the nth term of the sequence.

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

(b) The first four terms of a different sequence are given below.

4 10 18 28

(i) Find the next term.

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

(ii) The nth term of this sequence is $n(n + p)$ where p is an integer.

Find the value of p.

Answer(b)(ii) p = ... [2]

(iii) Find the 100th term of this sequence.

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

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8 Tom has 50 model cars.
He has 10 blue cars and 19 red cars.
He has no yellow cars.

(a) Tom chooses a car at random.

Write down the probability that it is

(i) red,

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

(ii) red or blue,

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

(iii) not blue,

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

(iv) yellow.

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

(b) The probability that a car is damaged is 1.

How many cars are damaged?

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

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9 The table below shows the number of visitors to a museum each day during one week.

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of visitors	64	34	75	77	85	96	38

(a) Work out the mean number of visitors per day during this week.

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

(b) Find the range.

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

(c) On the grid below, draw a bar chart to show the information given in the table.
Use a vertical scale of 1 cm to represent 10 visitors.

[5]

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10 In this question give all your answers correct to 2 decimal places.

(a) A bank has an exchange rate of \$1= € 0.6513.

(i) Jonathan changes \$500 into euros (€).
Calculate the amount Jonathan receives.

Answer(a)(i) € ..... [2]

(ii) Arika changes €300 into dollars.
Calculate the amount Arika receives.

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

(b) Dania borrows \$325 for 2 years at a rate of 3.8% per year **simple** interest.
Calculate the total amount Dania owes after 2 years.

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

(c) Lee borrows \$550 for 2 years at a rate of 6% per year **compound** interest.
Calculate the total amount Lee owes after 2 years.

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

Question 11 is printed on the next page.

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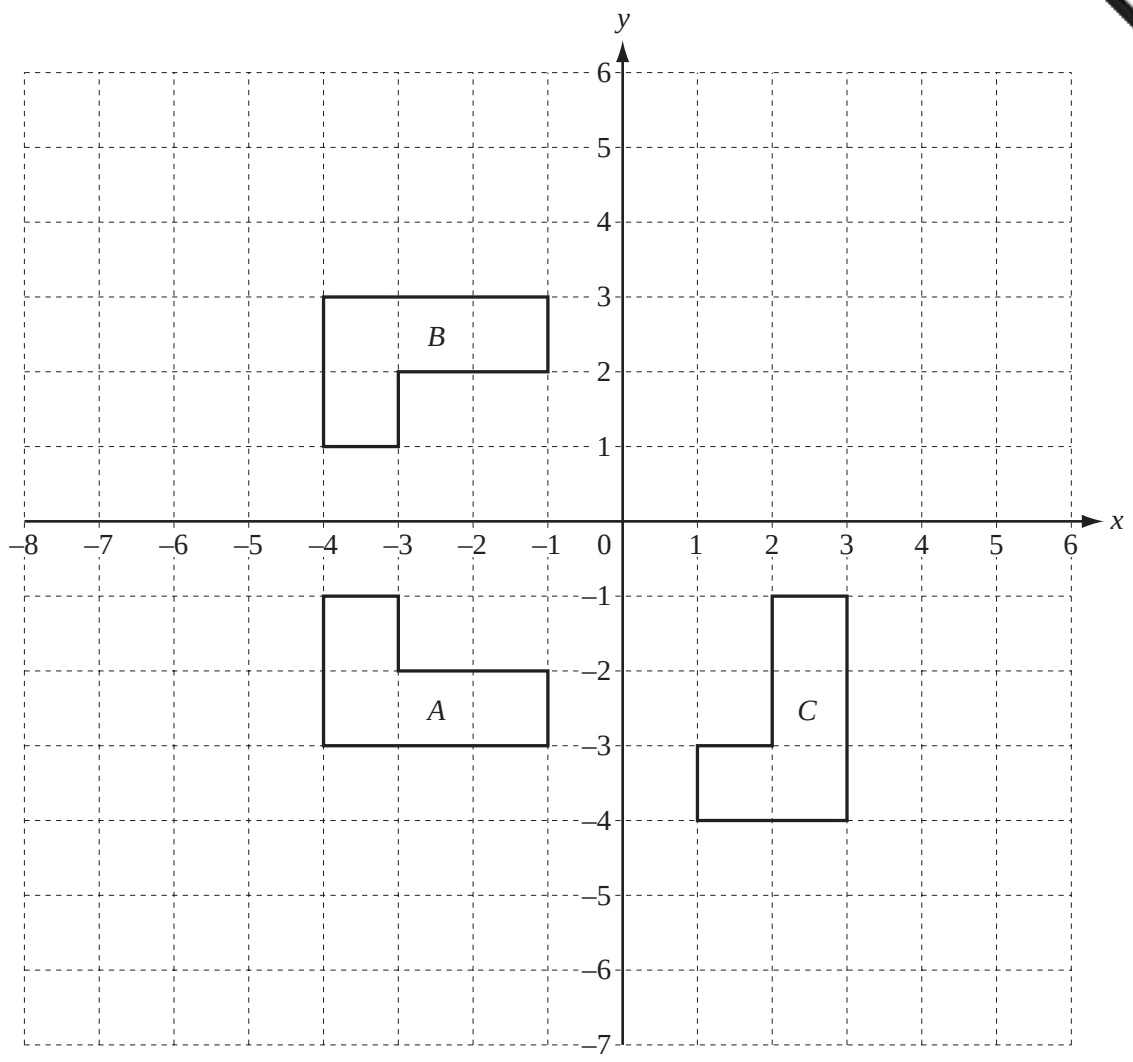
11



Shapes A, B and C are shown on the grid.

(a) Describe fully the **single** transformation which maps

(i) shape A onto shape B,

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

(ii) shape A onto shape C.

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

(b) On the grid draw the image of **shape *A*** after

(i) a translation by the vector $\begin{pmatrix} 6 \\ 4 \end{pmatrix}$, [2]

(ii) an enlargement, scale factor 2, centre the origin. [2]

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