Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

* 9 9 6 9 4 9 8 5 2 2 7 *

MATHEMATICS **0580/33**

Paper 3 (Core) **May/June 2014**

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.

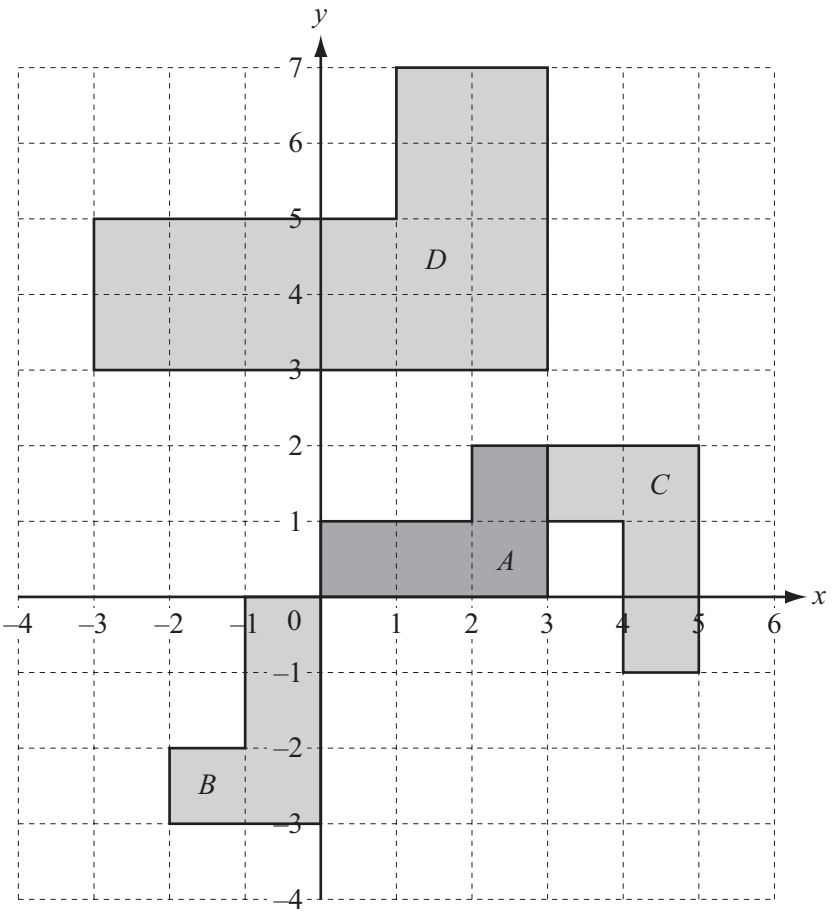
Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees 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.

1 (a)



Four shapes, *A*, *B*, *C* and *D*, are shown on the grid.

Describe fully the **single** transformation that maps shape *A* onto

(i) shape *B*,

Answer(a)(i) .....

..... [2]

(ii) shape *C*,

Answer(a)(ii) .....

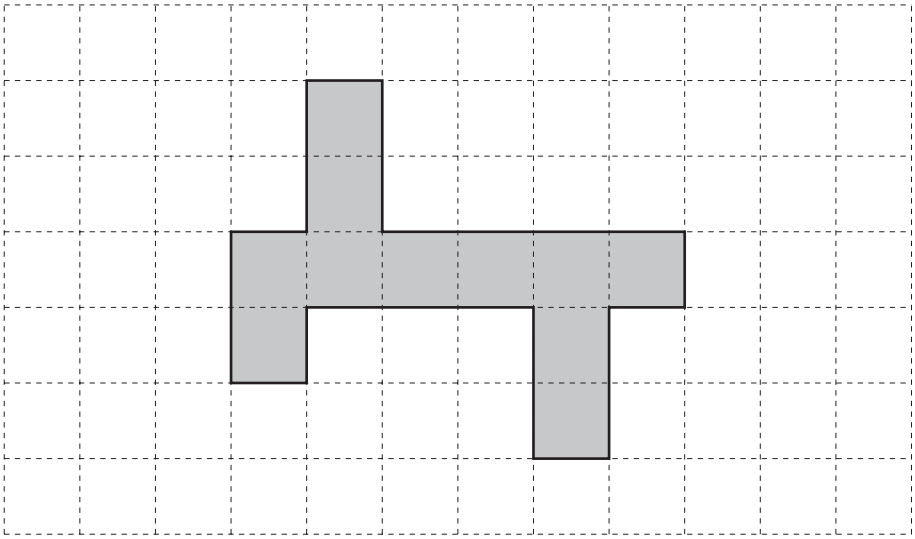
..... [3]

(iii) shape *D*.

Answer(a)(iii) .....

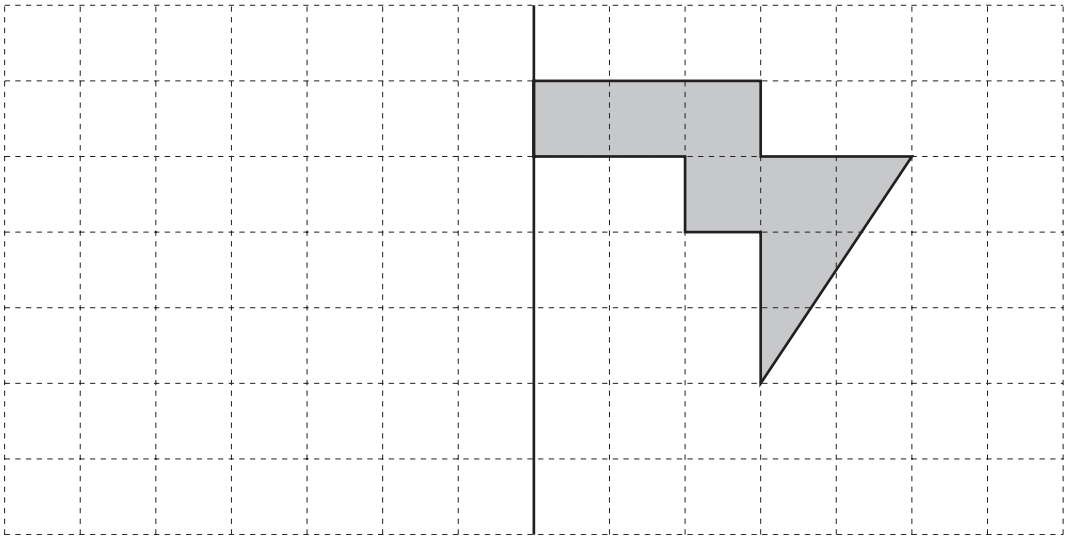
..... [3]

(b) (i)



Shade in **one more** square so that this shape has rotational symmetry of order 2. [1]

(ii)



Reflect this shape in the line of symmetry shown. [2]

2 A group of students take part in their school's sports day.

(a) (i) The length, l m, that Anna throws the javelin is 23.6 metres correct to the nearest 10 centimetres.

Complete the statement about l.

Answer(a)(i) ..... Y $l <$ ..... [2]

(ii) Billy throws the hammer a distance of 8 metres on his first throw.
His second throw is 15% further.

Calculate the distance of his second throw.

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

(iii) Carl runs 100 metres at a speed of 8 m/s.

Calculate the time it takes him to run 100 m.

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

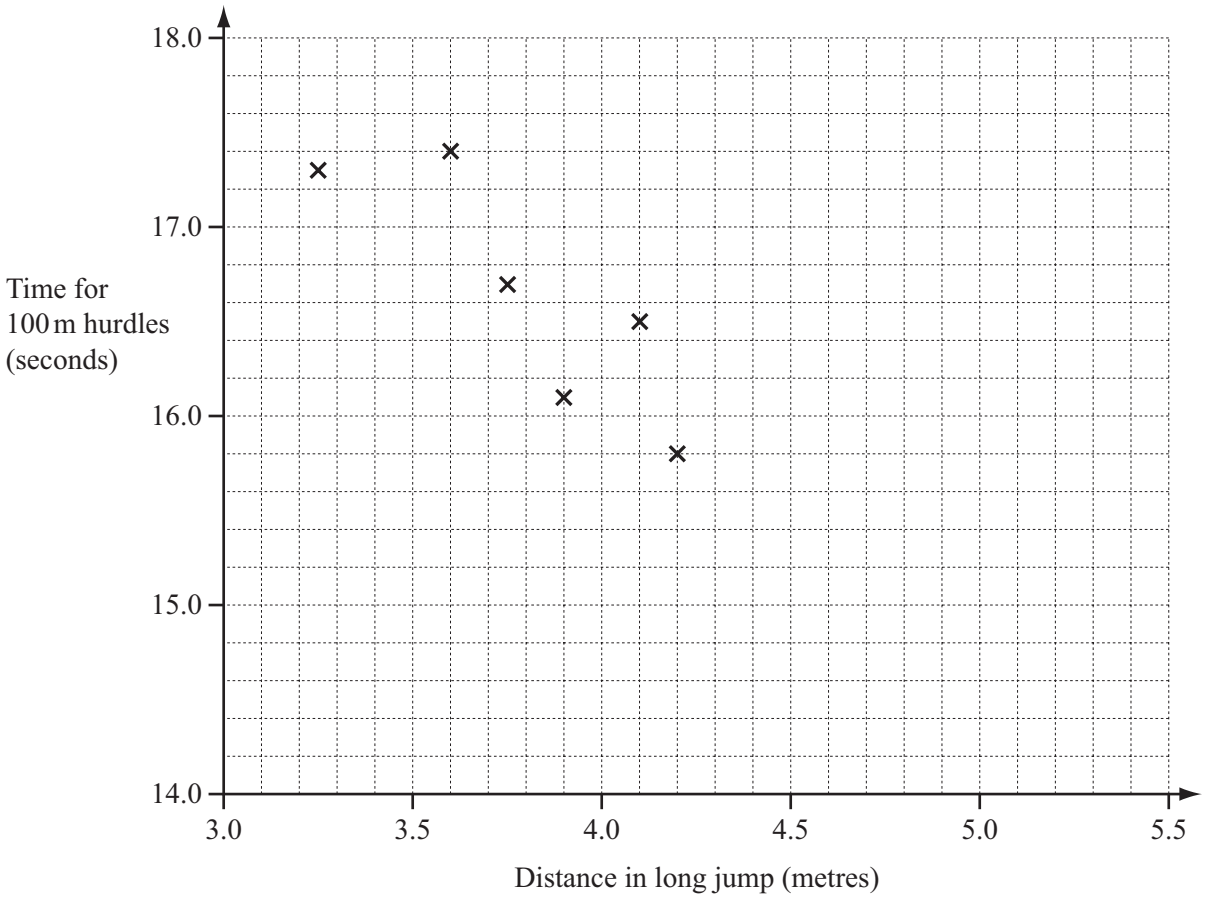
(iv) Change Carl's speed of 8 m/s into km/h.

Answer(a)(iv) ..... km/h [2]

(b) Ten students take part in both the long jump and 100 m hurdles competitions.
The results are shown in the table below.

Student	A	B	C	D	E	F	G	H	I	J
Distance in long jump (metres)	3.25	3.60	3.75	3.90	4.10	4.20	4.30	4.40	4.65	4.70
Time for 100 m hurdles (seconds)	17.3	17.4	16.7	16.1	16.5	15.8	15.3	14.8	15.5	15.0

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



[2]

(ii) What type of correlation does this scatter diagram show?

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

(iii) Describe the relationship between the distance in the long jump and the time for the 100 m hurdles.

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

(iv) On the grid, draw the line of best fit. [1]

(v) Another student jumps 3.50 m in the long jump.

Use your line of best fit to estimate the time for this student in the 100 m hurdles.

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

(vi) A different student jumps 5.20 m in the long jump.

Explain why you should not use your scatter diagram to estimate their time in the 100 m hurdles.

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

3 The Wong family spend the day at the zoo.

(a) The Wong family has 2 adults and 3 children aged 2, 5 and 11 years old.

Admission	
Adults	$8.50
Children 11-16 years	$6.00
Children 3-10 years	$4.50
Children under 3 years	FREE

Mr Wong pays for his family to go into the zoo using a $50 note.

Work out the change he receives.

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

(b) The dolphin show finishes at 11 05.
It lasts for 1 hour and 20 minutes.

Write down the time the dolphin show starts.

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

(c) Torty the tortoise was born on 27 December 1898.

Work out how many years old she was on 3 January 2003.

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

(d) Last year, the ratio snakes : lizards = 3 : 5 .
There were 45 lizards.

(i) Work out how many snakes there were last year.

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

(ii) This year, there are 3 more snakes and the same number of lizards.

Write down the new ratio snakes : lizards.
Give your answer in its simplest form.

Answer(d)(ii) ..... : ..... [2]

(e) Mr Wong hires a vehicle to drive around the zoo.
The cost is $25 for the first hour and $7.50 for every extra half hour.
He pays $85 altogether.

For how long does he hire the vehicle?

Answer(e) ..... hours [3]

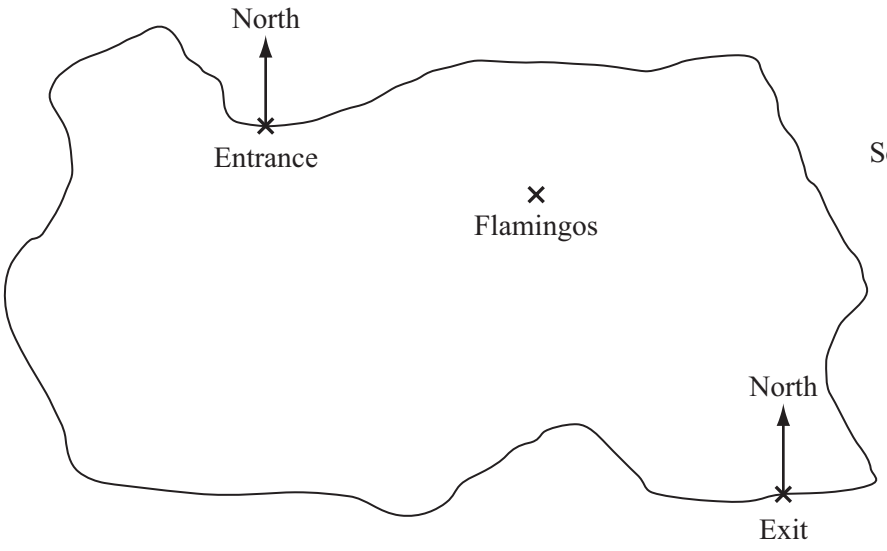
(f) Mrs Wong wants to buy some food for the giraffes.

Small Bag	Medium Bag	Large Bag
225g	250g	325g
60 cents	70 cents	90 cents

Work out which bag is the best value for money.
Show how you decide.

Answer(f) ..... [3]

(g) The diagram shows a map of the zoo.
The scale is 1 centimetre represents 50 metres.



Scale: 1 cm to 50 m

(i) Measure the bearing of the flamingos from the entrance.

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

(ii) Xanthe looks after all the animals within 200 m of the exit.

Draw accurately the locus of points inside the zoo which are 200 m from the exit. [2]

(iii) A shop, S, is on a bearing of 212° from the entrance and a bearing of 293° from the exit.

Mark the point S on the map. [3]

4 The ages of 15 children who go to a swimming club are shown below.

10	11	10	12	12
13	11	12	12	12
12	10	11	11	11

(a) Complete the frequency table.
You may use the tally column to help you.

Age	Tally	Frequency
10		
11		
12		
13		

[2]

(b) For the ages of the 15 children, find

(i) the range,

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

(ii) the mode,

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

(iii) the median,

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

(iv) the mean.

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

(c) One child is chosen at random from the group.

Write down the probability that the child's age is

(i) 10,

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

(ii) more than 13.

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

5 **(a)** **(i)** Write down the name of a solid which is **not** a prism.

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

(ii) A prism has a cross-sectional area, A, and height, h.

Write down an expression, in terms of A and h, for the volume of the prism.

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

(b) The volume, V, of a cylinder with radius r and height h is $V = \pi r^2 h$.

(i) Calculate the volume of a cylinder with radius 3 cm and height 12 cm.

Answer(b)(i) ..... cm^3 [2]

(ii) Ravi puts 150 identical marbles in the cylinder.
He fills the cylinder to the top with 160 cm^3 of water.

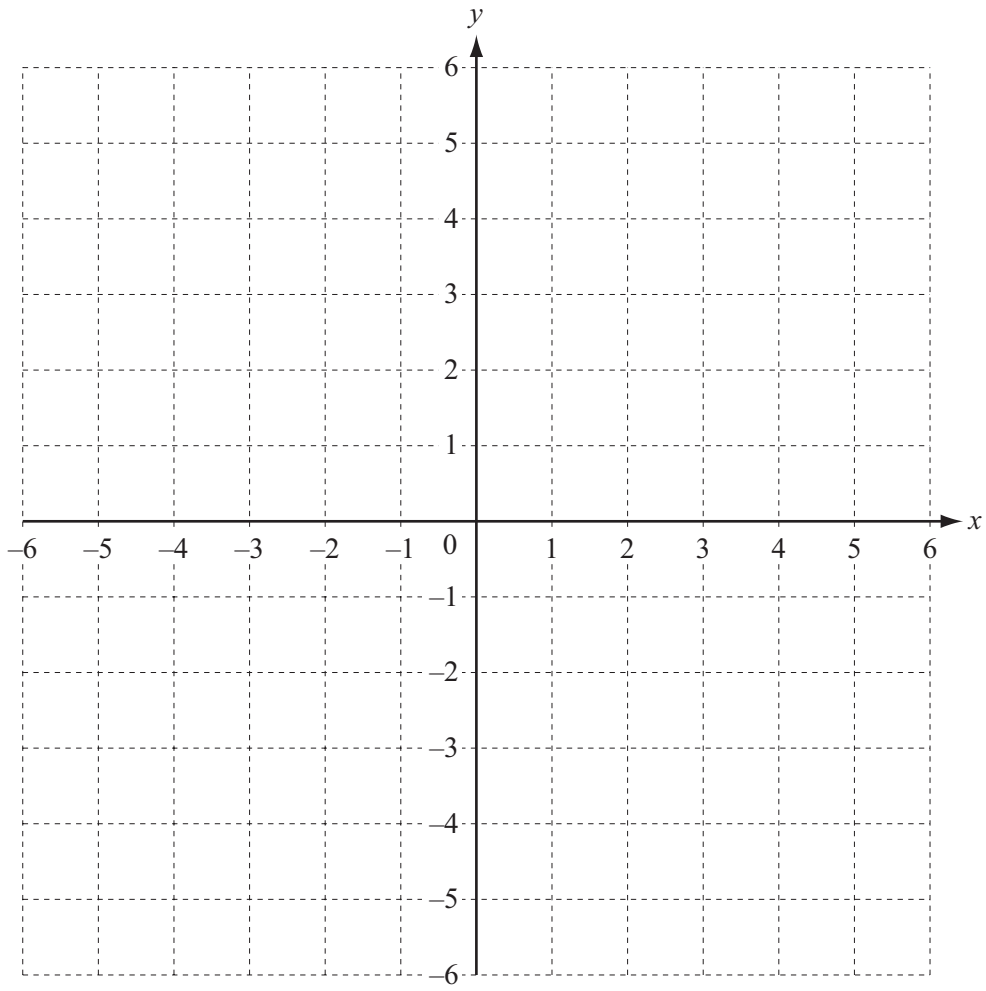
Find the volume of one marble.
Give your answer correct to 2 significant figures.

Answer(b)(ii) ..... cm^3 [4]

(iii) Make r the subject of the formula $V = \pi r^2 h$.

Answer(b)(iii) r = ... [2]

6



(a) On the grid, draw the graphs of

(i) $y = 5$, [1]

(ii) $x = -3$. [1]

(b) **(i)** Write down the co-ordinates of the point of intersection of $y = 5$ and $x = -3$.

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

(ii) Write down the equation of a line parallel to $y = 5$.

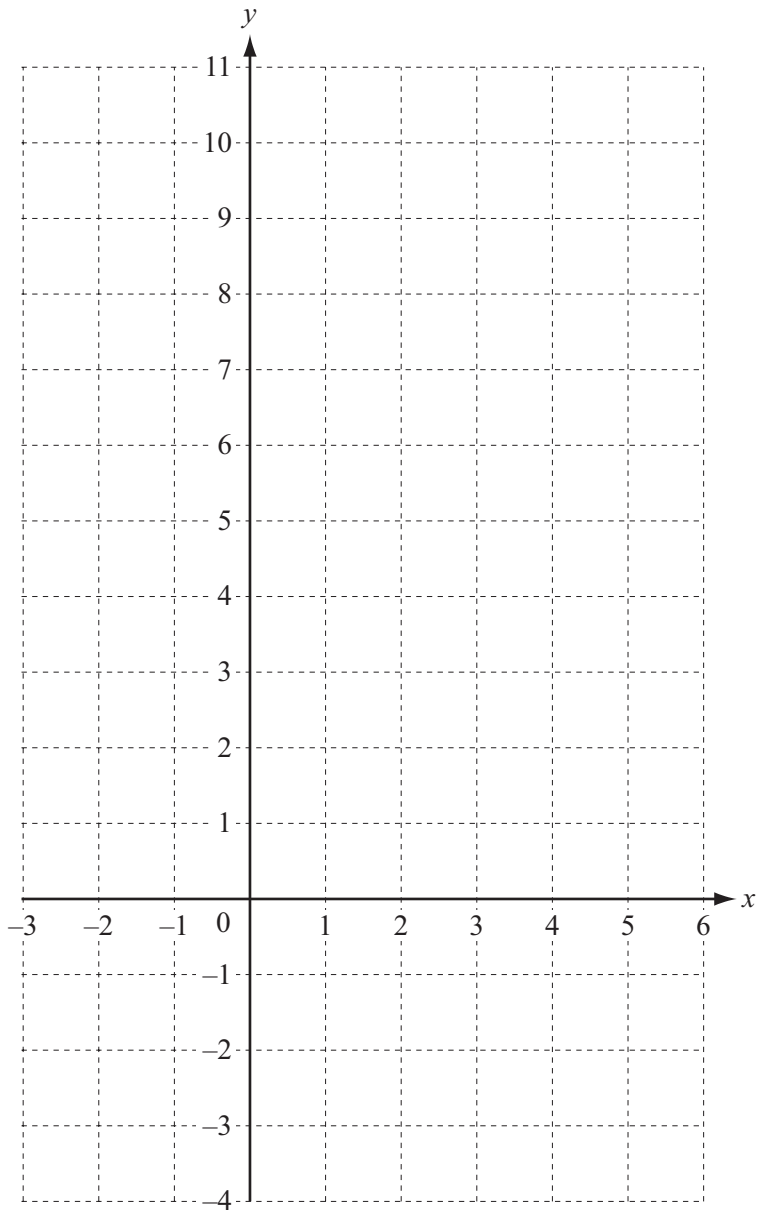
Answer(b)(ii) ..... [1]

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

x	–2	–1	0	1	2	3	4	5
y		4	0			0	4	

[2]

(ii) On the grid, draw the graph of $y = x^2 - 3x$ for $-2 \leq x \leq 5$.



[4]

(iii) Write down the co-ordinates of the lowest point of the graph.

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

7 Today it is Simon's birthday.

(a) Simon is x years old.
Katy is twice as old as Simon.
Bob is 8 years younger than Simon.

(i) Write expressions, in terms of x, for the ages of Katy and Bob.

Answer(a)(i) Katy .....

Bob ..... [2]

(ii) The sum of their three ages is 40 years.

Write an equation in terms of x.

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

(iii) Solve your equation for x.

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

(b) Simon's birthday cake weighs 600 grams.

He eats $\frac{1}{8}$ of the cake.
Katy eats 25% of the cake.
Bob eats 0.3 of the cake.

Find the weight of the cake that is left.

Answer(b) ..... g [4]

(c) Aunty Millie gives Simon $150 for his birthday.
He invests the money in a bank at a rate of 6% per year compound interest.

Calculate the **total** amount Simon will have after 3 years.

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

(d) One of Simon's presents is a bag of sweets.
He decides to eat the sweets in a sequence.
On day 1 he eats 1 sweet, on day 2 he eats 5 sweets, on day 3 he eats 9 sweets and so on.

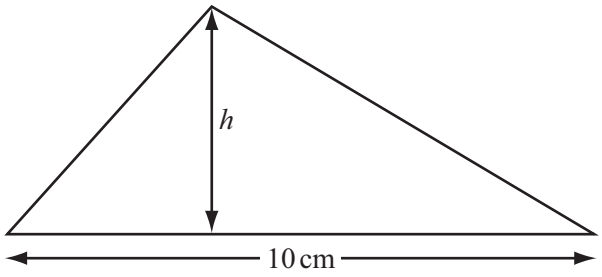
(i) Describe in words the rule for continuing the sequence 1, 5, 9, 13, 17 ..... .

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

(ii) Write down an expression for the number of sweets he eats on day n.

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

8 (a)



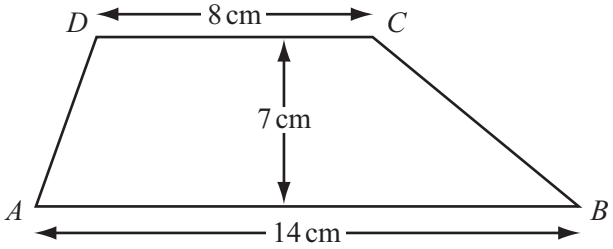
NOT TO SCALE

The triangle has an area of 30 cm^2 and a base of 10 cm.

Calculate the perpendicular height h of the triangle.

Answer(a) h = ... cm [2]

(b)



NOT TO SCALE

AB is parallel to *CD*.
AB is 14 cm and *CD* is 8 cm.
The perpendicular distance between *AB* and *CD* is 7 cm.

(i) Write down the mathematical name for the quadrilateral *ABCD*.

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

(ii) Calculate the area of *ABCD*.

Answer(b)(ii) ..... cm^2 [2]

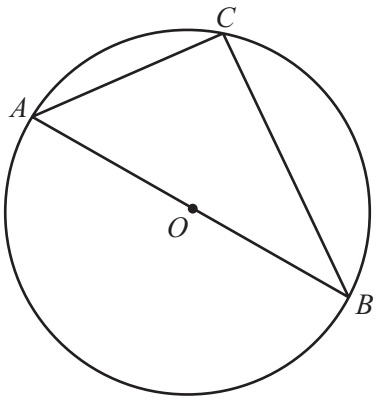
(c) An isosceles triangle has an angle of 40°.
Tikka draws the triangle with angles 40°, 70° and 70°.
Kanwarpreet draws a different correct triangle.

What angles did Kanwarpreet use?

Answer(c) 40°, ... , ... [2]

Question 9 is printed on the next page.

9



NOT TO SCALE

The diagram shows a circle with diameter AB and centre O.
C is a point on the circumference of the circle.

(a) Explain how you know that angle ACB is 90° without having to measure it.

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

(b) $AB = 13$ cm and $AC = 5$ cm.

Calculate the length BC.

Answer(b) $BC =$ ..... cm [3]

(c) Calculate angle ABC.

Answer(c) Angle $ABC =$ ..... [2]