Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

6519612675

MATHEMATICS **0580/32**

Paper 3 (Core) **February/March 2018**

2 hours

Candidates answer on the Question Paper.

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

READ THESE INSTRUCTIONS FIRST

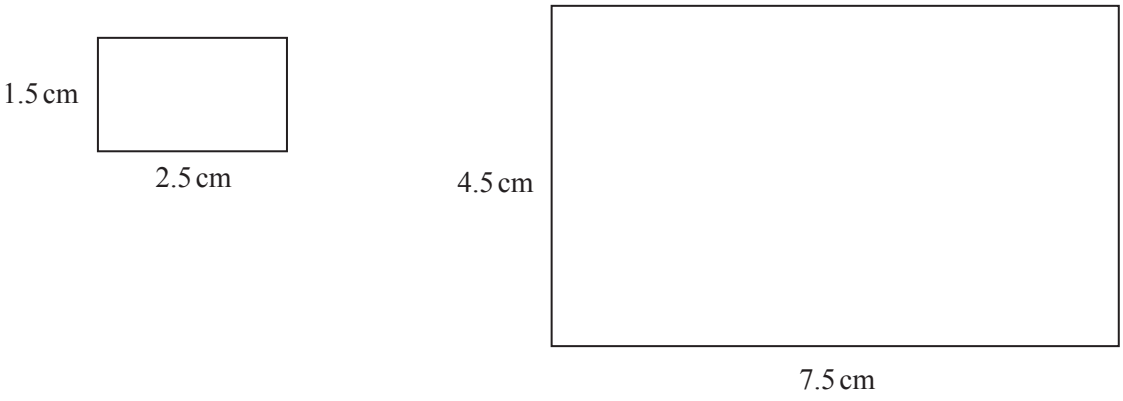
Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

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.

DC (SC/CGW) 147496/2
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1 (a)



(i) Explain why these rectangles are mathematically similar.

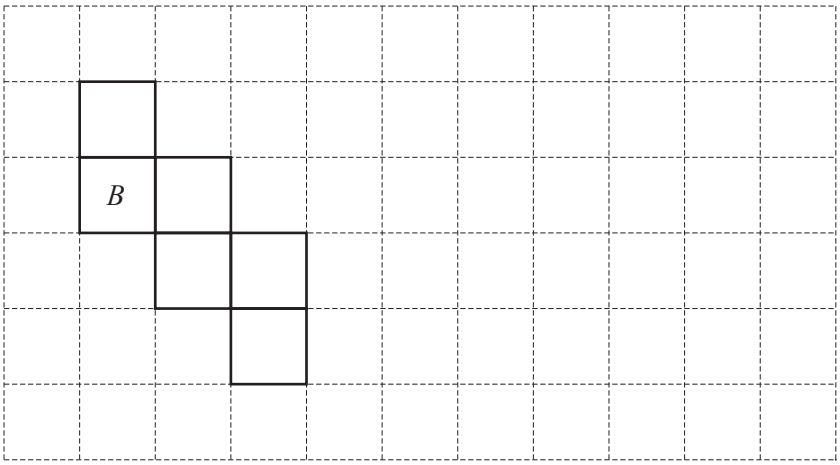
.....

..... [1]

(ii) How many times bigger is the area of the large rectangle than the area of the small rectangle?

..... [2]

(b)



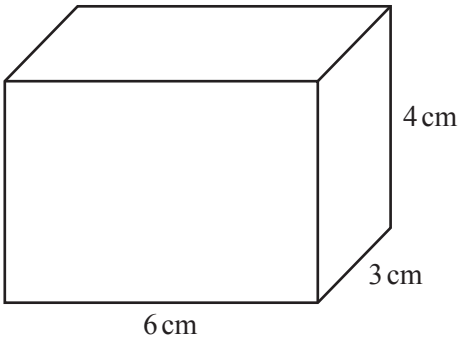
The diagram shows a net of a cube.

(i) The square labelled *B* is the base.

Write the letter *T* in the square that is the top of the cube. [1]

(ii) On the grid, draw a **different** net of this cube. [1]

(c) The diagram shows a cuboid.



NOT TO SCALE

(i) Work out the surface area of this cuboid.

..... cm^2 [3]

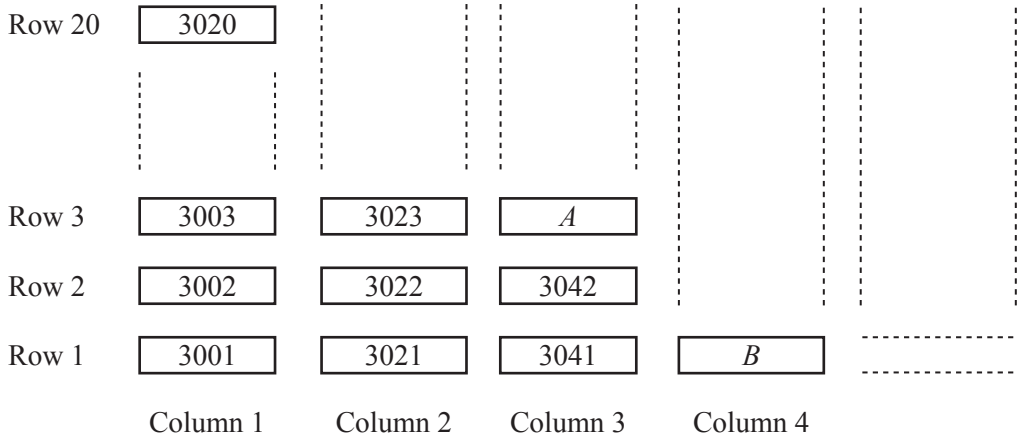
(ii) Work out the volume of this cuboid.

..... cm^3 [2]

(iii) Write down the dimensions of a different cuboid that has the same volume as this cuboid.

..... cm by ..... cm by ..... cm [1]

2 **(a)** Each of 196 candidates has a candidate number from 3001 to 3196.
The candidates sit in numerical order in columns and rows, as shown in the diagram.
There are 20 rows.
The diagram shows part of the plan for where the candidates sit.



(i) The diagram shows where candidates *A* and *B* sit.

Write down their numbers.

A .....

B ..... [2]

(ii) Complete this statement.

Candidate 3135 sits in Column ..... , Row ..... [2]

(iii) Candidate *C* sits in Column *n*, Row 1.

Find an expression, in terms of *n*, for the number of candidate *C*.

..... [2]

(b) The geography examination lasts for 1 hour 40 minutes.
Hari is allowed 25% extra time for his geography examination.

Work out the total time Hari has for this examination.
Give your answer in hours and minutes.

..... h ..... min [2]

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(c) The number of examinations that each of the 196 candidates takes is recorded in the table.

Number of examinations	5	6	7	8
Number of candidates	27	42	63	64

(i) Write down the range.

..... [1]

(ii) Find the median.

..... [1]

(iii) Calculate the mean.

..... [3]

(iv) A candidate is selected at random.

Find the probability that the candidate takes fewer than 8 examinations.

..... [2]

3 **(a)** 25 students go on a water sports trip.
The students each choose their favourite water sport.
These are the results.

Rafting	Fishing	Surfing	Snorkelling	Surfing
Snorkelling	Rafting	Kayaking	Rafting	Snorkelling
Fishing	Surfing	Surfing	Kayaking	Surfing
Fishing	Snorkelling	Surfing	Surfing	Rafting
Rafting	Fishing	Snorkelling	Snorkelling	Surfing

(i) Complete the frequency table for the results.
You may use the tally column to help you.

Favourite water sport	Tally	Frequency
Rafting		
Surfing		
Fishing		
Kayaking		
Snorkelling		

[2]

(ii) Write down the mode.

..... [1]

(iii) Work out the percentage of students whose favourite water sport is snorkelling.

..... % [1]

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(b) The table shows the times of the high and low tides.

Day	1st high tide	1st low tide	2nd high tide	2nd low tide
Monday	00 30	06 09	13 12	18 35
Tuesday	01 30	07 20	14 22	19 52
Wednesday	02 43	08 36	15 37	21 06
Thursday	03 58	09 41	16 44	22 07
Friday	05 00	10 35	17 37	22 58

(i) Write down the time of the 2nd high tide on Wednesday using the 12-hour clock.

..... [1]

(ii) Work out the time between the two low tides on Thursday.

..... h ..... min [1]

(iii) The surfing activity starts $1\frac{1}{2}$ hours before the high tide on Tuesday afternoon.

Write down the time that the surfing activity starts.

..... [1]

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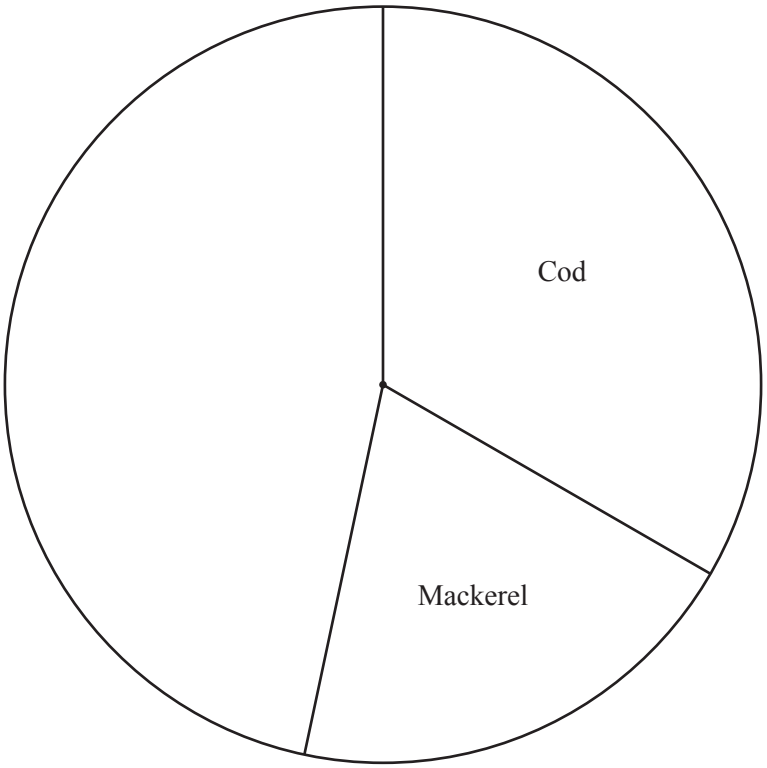
[Turn over

4 **(a)** Some people go fishing and catch four types of fish.
Some information is shown in the table.

Type of fish	Number of fish	Pie chart sector angle
Cod	15	120°
Mackerel	9	72°
Herring		32°
Tuna		

(i) Complete the table. [3]

(ii) Complete the pie chart.



[1]

(b) Records show that $\frac{3}{14}$ of all mullet caught are underweight.
In one day, 168 mullet are caught.

Work out the expected number of mullet that are underweight.

..... [1]

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5 **(a)** Write down

(i) the number 604 925 in words,

.....

..... [1]

(ii) a prime number between 50 and 60,

..... [1]

(iii) the value of 999^0.

..... [1]

(b) Find

(i) the smallest multiple of 7 that is greater than 100,

..... [1]

(ii) the largest cube number that is less than 100,

..... [1]

(iii) the six factors of 45,

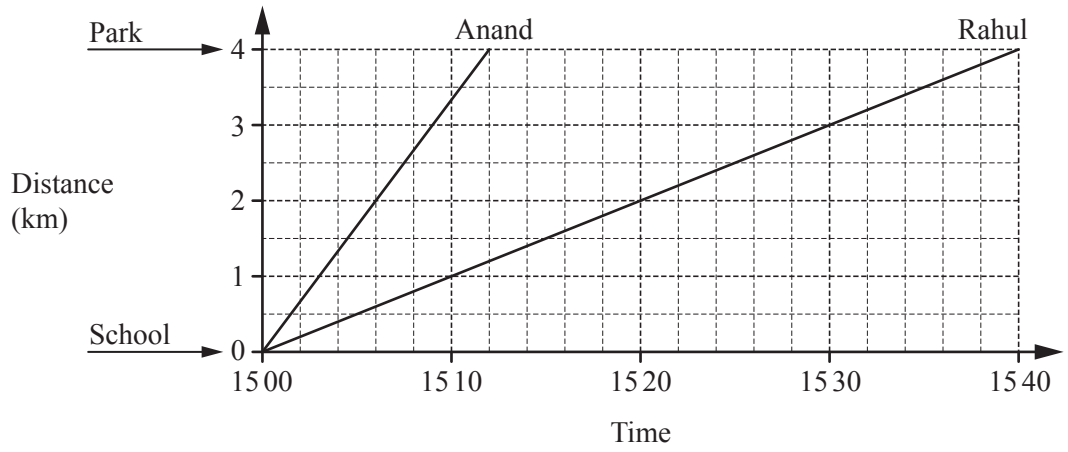
..... , ... , ... , ... , ... , ... [2]

(iv) an irrational number between 6 and 7.

..... [1]

6 Anand, Rahul and Samir go from school to the park each day.

(a) One day, Anand cycles and Rahul walks.
The travel graph shows their journeys.



(i) Work out the speed that Anand cycles.
Give your answer in kilometres per hour.

..... km/h [2]

(ii) Find the number of minutes that Anand arrives at the park before Rahul.

..... min [1]

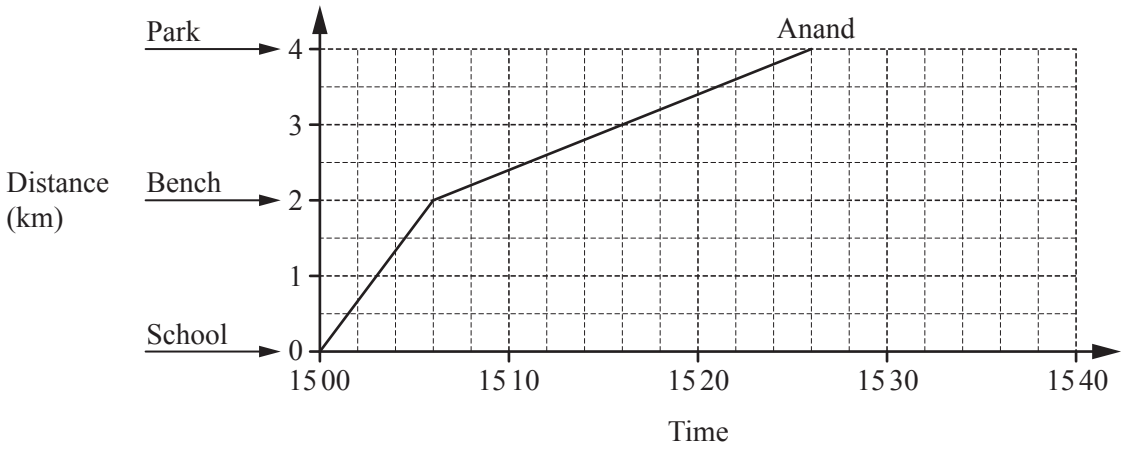
(iii) Samir cycles at the same speed as Anand.
He arrives at the park at the same time as Rahul.

Find the time that Samir leaves school.

..... [1]

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(b) On another day, Anand cycles 2 km to a bench and then walks the rest of the way to the park. The travel graph shows his journey.



(i) Write down the ratio minutes cycling : minutes walking.
Give your answer in its simplest form.

..... : ..... [2]

(ii) Rahul leaves school at the same time as Anand.
Rahul walks 2 km to the bench at a constant speed of 6 km/h.
He then cycles the rest of the way to the park at a constant speed of 15 km/h.

(a) Complete the travel graph for Rahul's journey to the park.

[2]

(b) Use your travel graph to find the number of minutes that Anand arrives at the **bench** before Rahul.

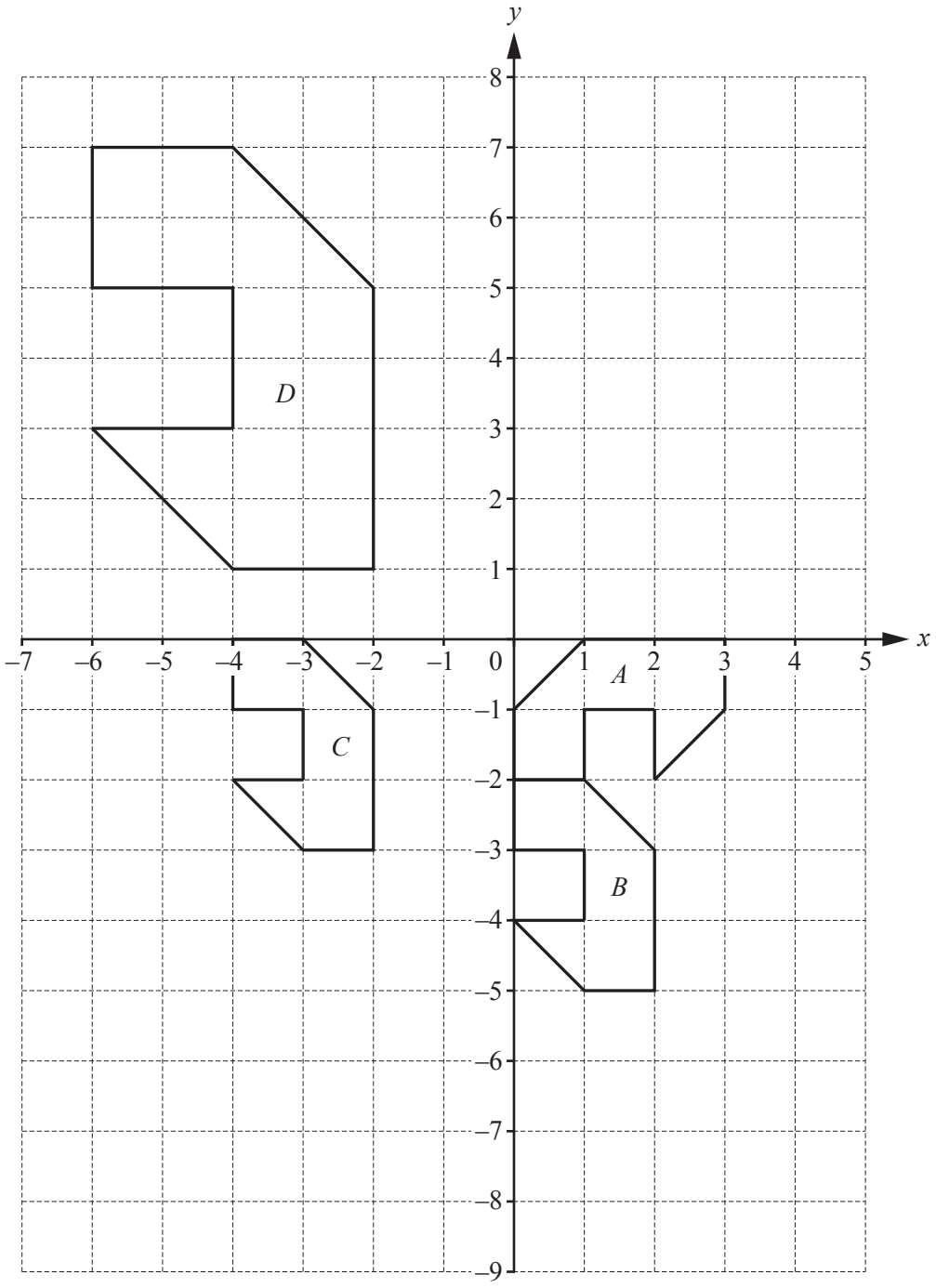
..... min [1]

(c) Find the greatest distance between Anand and Rahul as they travel to the park.

..... km [1]

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7



The diagram shows four shapes, A, B, C and D, drawn on a 1 cm^2 grid.

(a) Find the area of shape B.

..... cm^2 [1]

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

(i) shape *A* onto shape *B*,

.....

..... [3]

(ii) shape *B* onto shape *C*,

.....

..... [2]

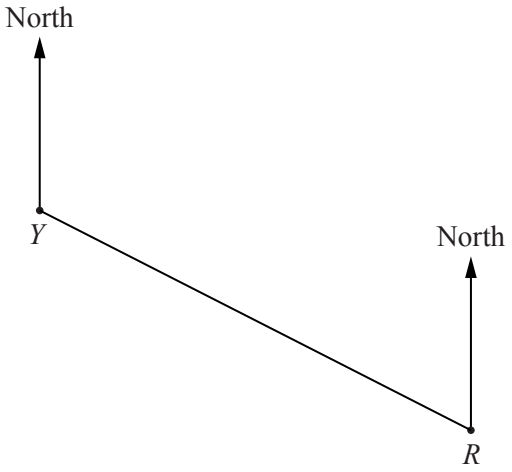
(iii) shape *C* onto shape *D*.

.....

..... [3]

(c) On the grid, draw the image of shape *D* after a reflection in the line $x = -1$. [2]

8 **(a)** The scale drawing shows the positions of two towns, Yatterford (Y) and Rexley (R), on a map.
The scale is 1 centimetre represents 15 kilometres.



Scale: 1 cm to 15 km

(i) Write the scale of the map in the form 1: n.

1 : ..... [2]

(ii) Work out the actual distance of Rexley from Yatterford.

..... km [2]

(iii) Measure the bearing of Rexley from Yatterford.

..... [1]

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(iv) A hospital is to be built on an area of land between 45 km and 60 km from Yatterford. The bearing of the hospital from Yatterford is between 250° and 295°.

On the map, construct and shade the region in which the hospital is to be built.

[5]

(b) The bearing of Bartown from Whitestoke is 073°.

Work out the bearing of Whitestoke from Bartown.

..... [2]

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[Turn over

9 A shop sells pens and notebooks.
The cost of a pen is p cents and the cost of a notebook is n cents.

(a) On Monday, the shop sells 5 pens and 4 notebooks for 450 cents.

Complete the equation.

$5p + 4n =$ ..... [1]

(b) On Tuesday, the shop sells 10 pens and 3 notebooks for 525 cents.

Write this information as an equation.

..... = ... [2]

(c) Solve your two equations to find the cost of a pen and the cost of a notebook.
You must show all your working.

Cost of a pen = ... cents

Cost of a notebook = ... cents [3]

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10 (a) Seven students want to join the school diving club.
Some information about these students is recorded in the table below.

Name	Month and year of birth	Height (metres)	Distance each student can swim (metres)
Arj	November 2004	1.62	200
Biva	October 2006	1.43	500
Cala	February 2006	1.53	1500
Dainy	January 2007	1.56	1000
Elu	December 2005	1.64	600
Ful	August 2006	1.52	1000
Gani	January 2006	1.46	1000

To join the diving club you must be

- at least 12 years old in March 2018

and

- at least 150 centimetres tall

and

- able to swim at least 0.5 kilometres.

Write down the names of the students who can join the club.

..... [2]

(b) The students dive off boards of different heights.
The speed, s m/s, that they enter the water from a board of height h metres, can be found using this formula.

$$s = \sqrt{19.6h}$$

(i) Calculate the value of s when $h = 10$.

$s =$ ..... [2]

(ii) Make h the subject of the formula.

$h =$ ..... [2]

11 **(a)** A, B, C and D are four equations of straight line graphs.

A	$y = -3x + 4$

B	$y = 4x - 3$

C	$y = 3x - 4$

D	$y = -4x - 3$

(i) Write down the letter of the graph that

(a) passes through the point $(1, -1)$,

..... [1]

(b) has a y-intercept of 4,

..... [1]

(c) has a gradient of -4.

..... [1]

(ii) The point $(p, -26)$ lies on the line $y = -3x + 4$.

Work out the value of p.

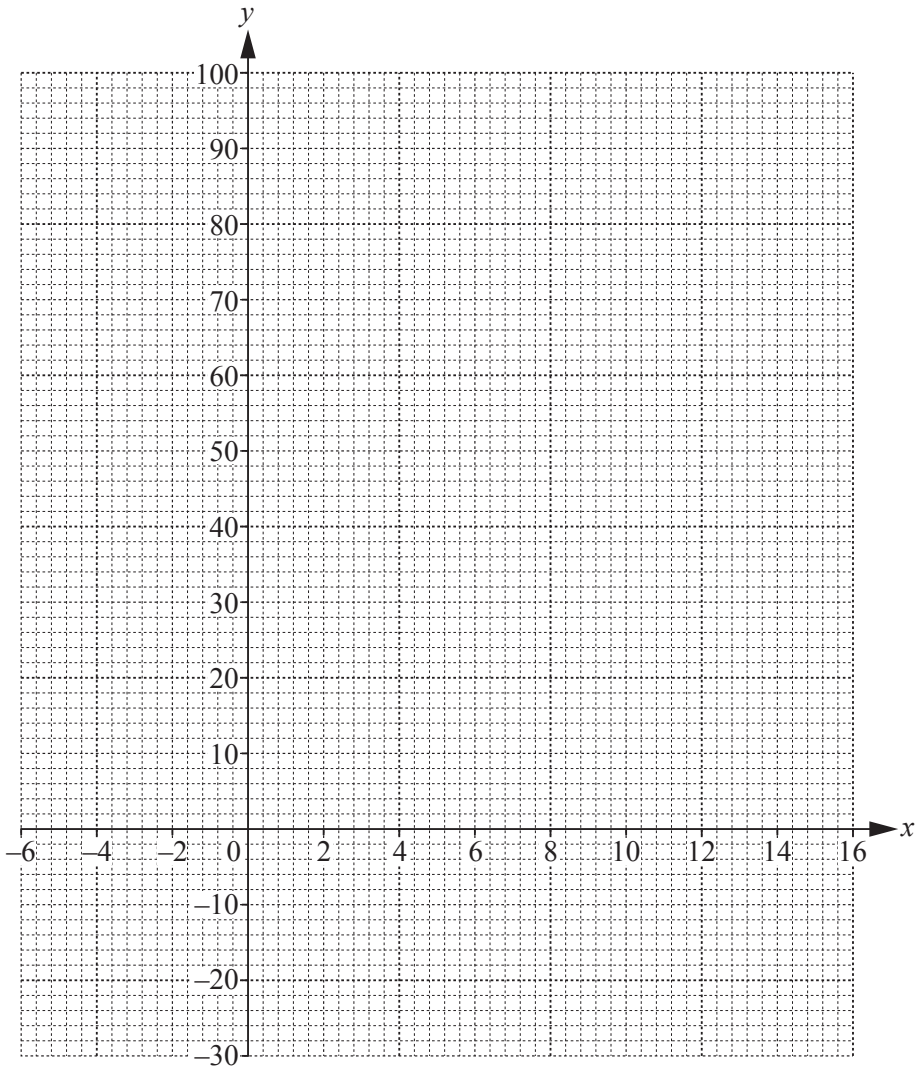
$p =$ ..... [2]

(b) (i) Complete the table of values for $y = x^2 - 10x$.

x	-6	-3	0	3	6	9	12	15
y	96			-21	-24		24	75

[3]

(ii) On the grid, draw the graph of $y = x^2 - 10x$ for $-6 \leqslant x \leqslant 15$.



[4]

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

(..... , ...) [1]

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