Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

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7816467950

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/33**

Paper 3 (Core) **May/June 2019**

1 hour 45 minutes

Candidates answer on the Question Paper.

Additional Materials: Geometrical Instruments
Graphics Calculator

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.
Do not use staples, paper clips, glue or correction fluid.
You may use an HB pencil for any diagrams or graphs.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** the questions.
Unless instructed otherwise, give your answers exactly or correct to three significant figures as appropriate.
Answers in degrees should be given to one decimal place.
For π, use your calculator value.
You must show all the relevant working to gain full marks and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is 96.

This document consists of **18** printed pages and **2** blank pages.

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Formula List

Area, A, of triangle, base b, height h.	$A = \frac{1}{2}bh$
Area, A, of circle, radius r.	$A = \pi r^2$
Circumference, C, of circle, radius r.	$C = 2\pi r$
Curved surface area, A, of cylinder of radius r, height h.	$A = 2\pi rh$
Curved surface area, A, of cone of radius r, sloping edge l.	$A = \pi rl$
Curved surface area, A, of sphere of radius r.	$A = 4\pi r^2$
Volume, V, of prism, cross-sectional area A, length l.	$V = Al$
Volume, V, of pyramid, base area A, height h.	$V = \frac{1}{3}Ah$
Volume, V, of cylinder of radius r, height h.	$V = \pi r^2 h$
Volume, V, of cone of radius r, height h.	$V = \frac{1}{3}\pi r^2 h$
Volume, V, of sphere of radius r.	$V = \frac{4}{3}\pi r^3$

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Answer **all** the questions.

1 **(a)** 7 8 9 10 11 12 13

From this list of numbers, write down

(i) an even number,

..... [1]

(ii) a multiple of 5,

..... [1]

(iii) a factor of 27.

..... [1]

(b) Write

(i) 33% as a decimal,

..... [1]

(ii) $\frac{3}{4}$ as a decimal,

..... [1]

(iii) 20% as a fraction,

..... [1]

(iv) 0.9 as a percentage.

.....% [1]

(c) Write 6.666 correct to 1 decimal place.

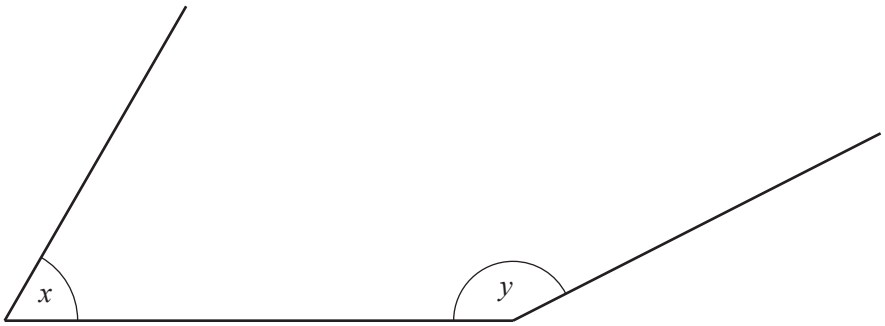
..... [1]

(d) Work out $\sqrt{40}$.
Give your answer correct to 2 significant figures.

..... [2]

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2 (a)

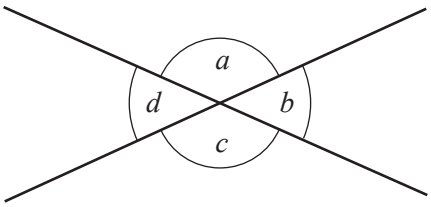


Measure angle x and angle y.

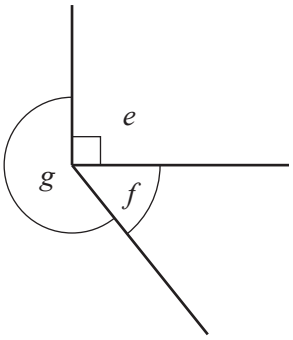
x = ...

y = ... [2]

(b)



NOT TO SCALE



In the first diagram, two lines intersect.
In the second diagram, three lines meet at a point.

(i) Complete each statement using one letter from either diagram.

Angle ..... is acute.

Angle ..... is reflex. [2]

(ii) Complete each statement with a number.

e = ...°

$d + a$ = ...°

$e + f + g$ = ...°

[3]

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3 (a)

Item	Item cost ($)	Number of items	Cost ($)
Bread	2.35	3	
Milk	3.00	4	
Eggs	2.82	1	
Cheese	22.04	1	
		Total cost ($)	

(i) Complete the shopping bill. [2]

(ii) Work out how much change there will be from $50.

$ ..... [1]

(b) A jar of coffee usually costs $7.50 .
This cost is reduced by 4%.

By how much is the cost reduced?

$ ..... [1]

(c) Water can be bought in a pack of 6 bottles or a pack of 10 bottles.
In both packs, the bottles are the same size.

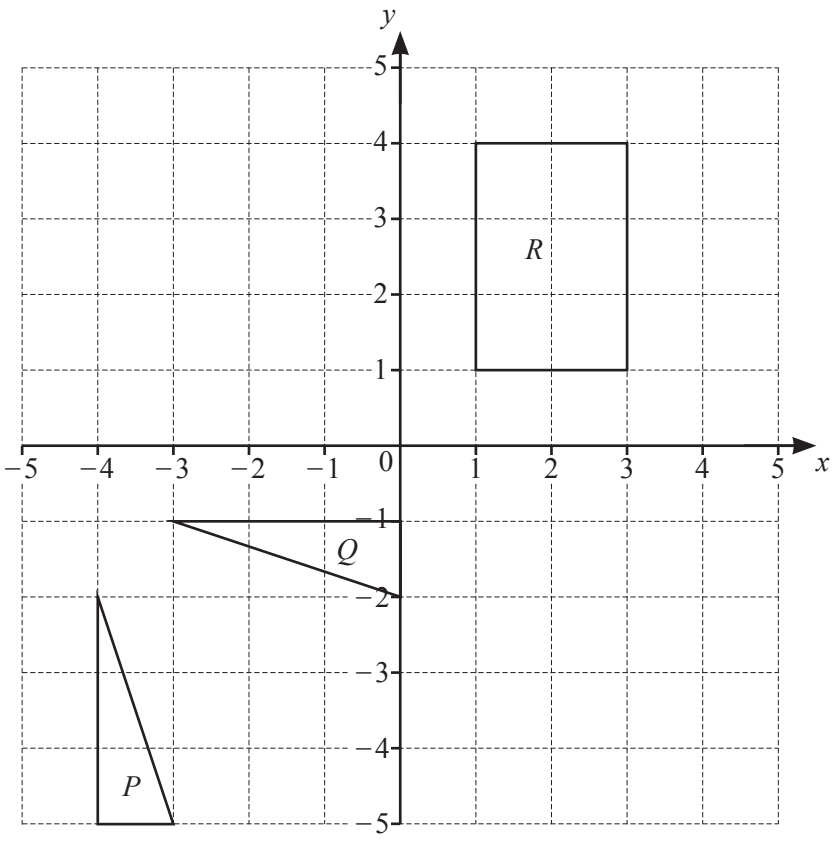
Pack of 6 bottles costs $1.38
Pack of 10 bottles costs $2.20

Work out which pack is the better value.
Show all your working.

Pack of ..... bottles is the better value [3]

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4 (a)



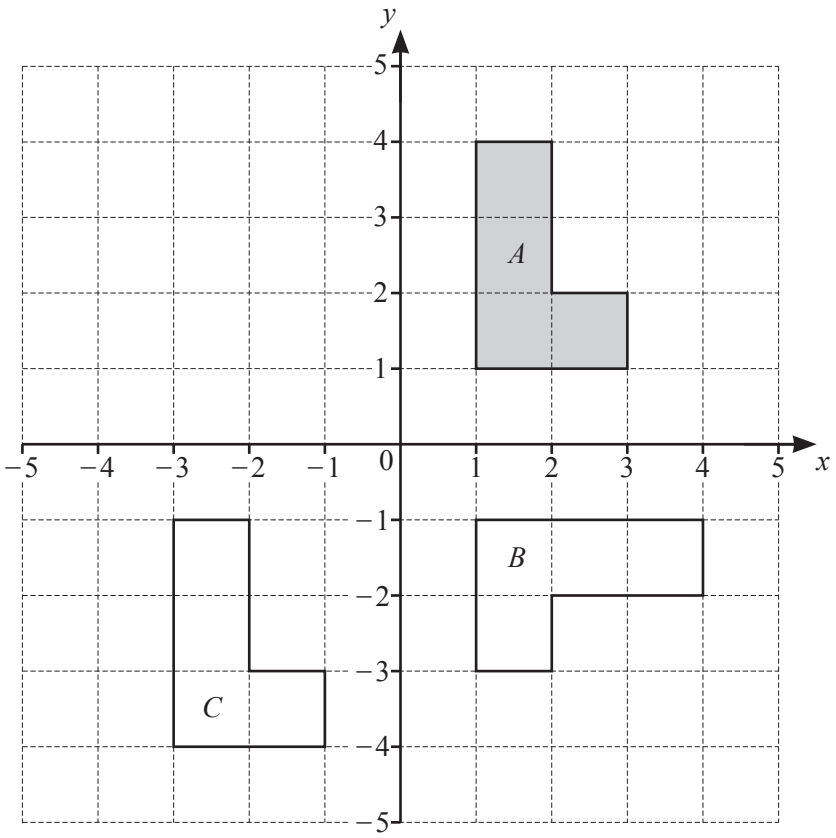
(i) On the grid, draw the reflection of rectangle R in the y-axis. [1]

(ii) Triangle P is a reflection of triangle Q.

On the grid, draw the line of reflection. [1]

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(b)



(i) Describe fully the **single** transformation that maps shape *A* onto shape *B*.

.....

..... [3]

(ii) Describe fully the **single** transformation that maps shape *A* onto shape *C*.

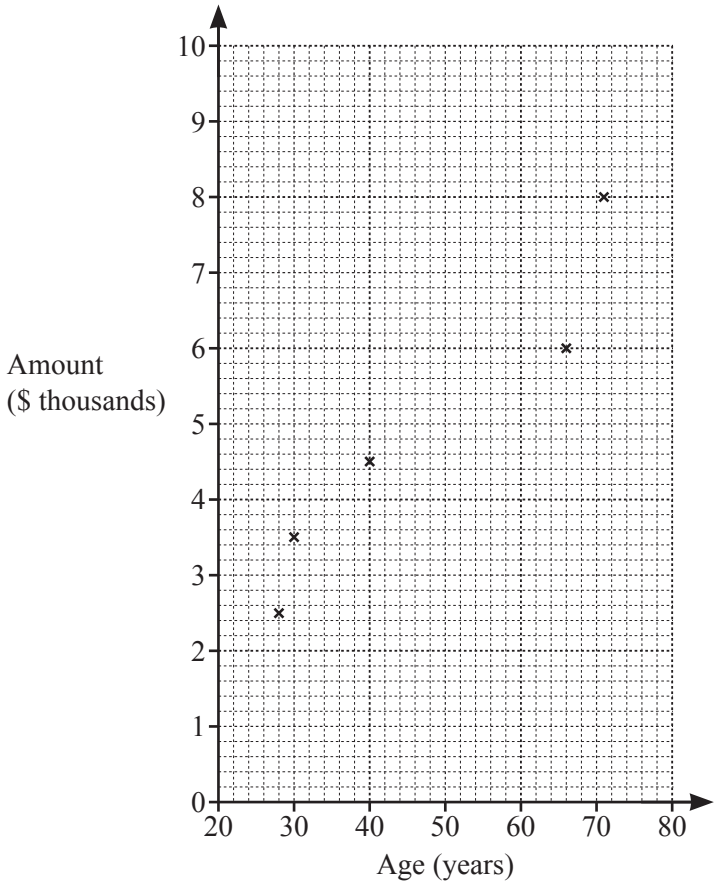
.....

..... [2]

5 **(a)** Ten people each invest money in a bank.
The amount each person invests and their age is shown in the table.

Age (years)	28	40	30	66	71	70	62	56	75	22
Amount ($ thousands)	2.5	4.5	3.5	6	8	7	7.5	6	9	3

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



[2]

(ii) Work out the mean age and the mean amount.

Mean age ..... years

Mean amount $ ..... thousands [2]

(iii) Using your answers to **part (ii)**, draw a line of best fit on the scatter diagram. [2]

(iv) Use your line of best fit to estimate how much someone aged 60 might invest.

$ ..... thousands [1]

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(b) 100 other people were asked how much they had invested in the bank.
The table below shows this information.

Amount ($\$ x$)	Number of people
$0 \leqslant x < 1000$	29
$1000 \leqslant x < 2000$	26
$2000 \leqslant x < 3000$	19
$3000 \leqslant x < 4000$	14
$4000 \leqslant x < 5000$	12

(i) Write down the modal group.

..... $\leqslant x <$ ..... [1]

(ii) Work out an estimate of the mean.

$ ..... [3]

6 **(a)** Simplify fully.

(i) $6p - 2p$

..... [1]

(ii) $7k + 5g + 3k - g$

..... [2]

(b) Solve.

$4x = 2x + 10$

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

(c) Multiply out the brackets.

$3(9x - 4)$

..... [1]

(d)

$$A = L \times W$$

$$P = 2L + 2W$$

Work out the value of A and the value of P when $L = 7$ and $W = 5$.

$A =$ .....

$P =$ ..... [3]

(e) Write down the value of x^0 .

..... [1]

(f) Simplify.

(i) $t^5 \times t^4$

..... [1]

(ii) $\frac{p^7}{p^2}$

..... [1]

(g) Write down all the integer values of n that satisfy this inequality.

$$1 < n \leqslant 5$$

..... [1]

7 Some students are each asked how many cats and how many rabbits they have as pets.
Each of the students has no other pets.
The results are shown in the table.

Example: the shaded square shows 1 student has 2 rabbits and 4 cats.

Number of rabbits \ Number of cats	0	1	2	3	4
0	4	3	1	2	0
1	1	1	0	1	1
2	3	2	2	2	1
3	2	1	0	2	0
4	2	2	0	0	0

(a) Find the total number of students asked.

..... [1]

(b) Work out the number of students with

(i) exactly 3 cats,

..... [1]

(ii) exactly 4 pets,

..... [1]

(iii) fewer than 3 pets,

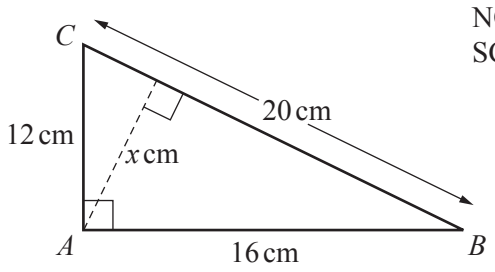
..... [1]

(iv) the same number of cats as rabbits.

..... [1]

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8 (a)



(i) Work out the perimeter of triangle *ABC*.

..... cm [1]

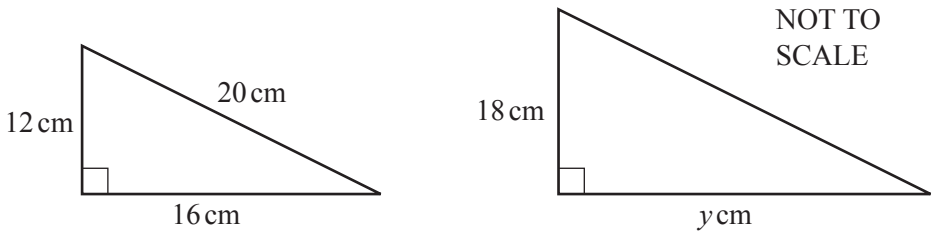
(ii) Work out the area of triangle *ABC*.

.....cm^2 [1]

(iii) Using your answer to **part (ii)**, find the value of x.

x = ... [2]

(b) These two triangles are mathematically similar.



Find the value of y.

y = ... [2]

9 $\mathsf{U} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$S = \{2, 3, 5, 7\}$
$T = \{1, 3, 5, 7, 9\}$

(a) Write down

(i) $\mathrm{n}(S)$,

..... [1]

(ii) $S \cap T$,

{.....} [1]

(iii) $S \cup T$,

{.....} [1]

(iv) S'.

{.....} [1]

(b) **(i)** A number is chosen at random from S.

Work out the probability that it is 3.

..... [1]

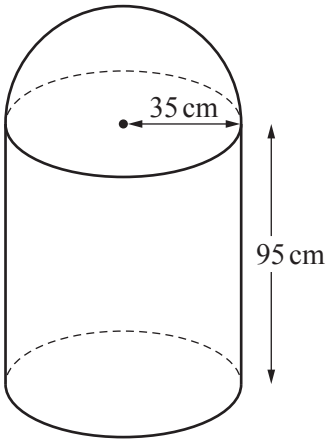
(ii) 60 students each choose a number at random from S.

Find the expected number of times that 3 is chosen.

..... [1]

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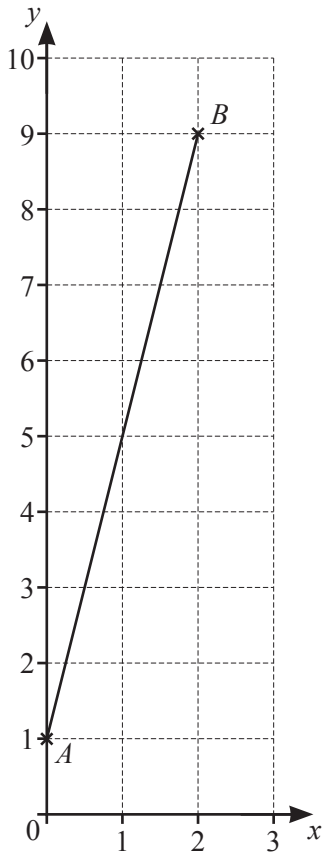
NOT TO SCALE

A container is made from a cylinder and a hemisphere.
The cylinder has radius 35 cm and height 95 cm and the hemisphere has radius 35 cm.
The container is full of water.

Calculate the total volume of water in the container.
Give your answer in litres.

..... litres [4]

11 The line AB is drawn on a 1 cm^2 grid.



(a) Write down the co-ordinates of the midpoint of the line AB.

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

(b) Find the gradient of the line AB.

..... [2]

(c) Use Pythagoras' Theorem to work out the length of AB.

AB = ... cm [3]

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12 (a) (i) The mass of the Earth's atmosphere is 5.15×10^{18} kg.

When 5.15×10^{18} is written as an ordinary number, how many zeros are there in the number?

..... [1]

(ii) 0.000 055% of the Earth's atmosphere is hydrogen.

Write 0.000 055 in standard form.

..... [1]

(b) (i) The International Space Station travels round the Earth at a height of 450 km.

Write 450 km in centimetres.
Give your answer in standard form.

..... cm [2]

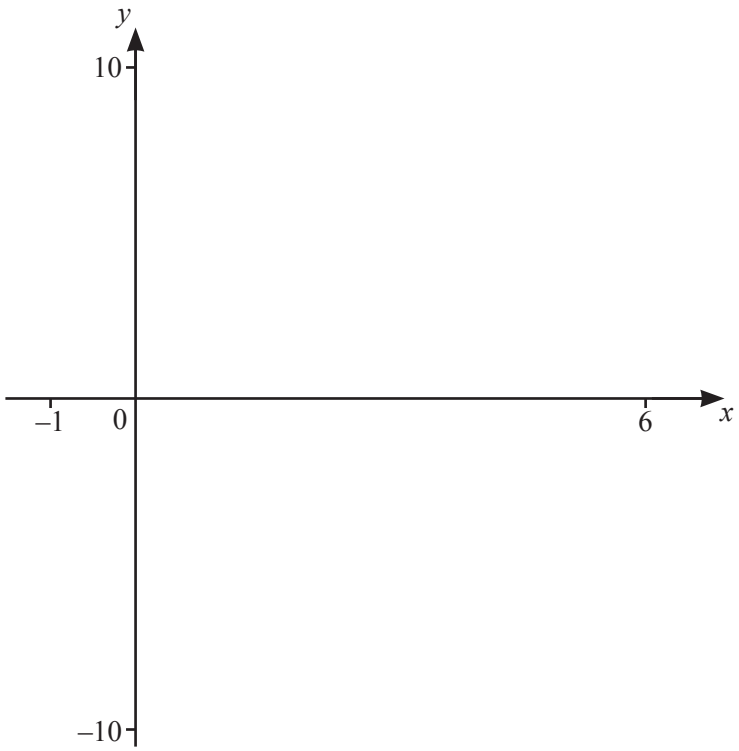
(ii) The International Space Station travels at a speed of 8 km/s.

Work out the distance it travels in 1 day.

..... km [2]

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(a) **(i)** On the diagram, sketch the graph of $y = 5x - x^2$ for $-1 \leqslant x \leqslant 6$. [2]

(ii) Find the co-ordinates of the local maximum.

(..... , ...) [2]

(b) On the diagram, sketch the graph of $y = x + 3$ for $-1 \leqslant x \leqslant 6$. [2]

(c) Solve this equation.

$$5x - x^2 = x + 3$$

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

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