Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
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CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/32**

Paper 3 (Core) **May/June 2017**

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 **16** printed pages.

CAMBRIDGE International Examinations

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.	$V = \frac{4}{3}\pi r^3$

Answer **all** the questions.

1 **(a)** Write in words the number 70 302.

..... [1]

(b) Work out 13.68^3.

Write down all the numbers on your calculator display.

..... [1]

(c) Write 623.892

(i) correct to 2 decimal places,

..... [1]

(ii) correct to 3 significant figures,

..... [1]

(iii) correct to the nearest 100.

..... [1]

(d) Find the value of $8x + 5y$ when $x = 7$ and $y = -9$.

..... [2]

(e) Solve.

$54 - 8x = 10$

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

2 Amir has 12 hens.

(a) Each hen lays 5 eggs every week.

(i) Work out the total number of eggs Amir collects each week.

..... [1]

(ii) Amir sells the eggs at \$2.10 for 10 eggs.
He sells **all** the eggs.

Work out how much money he receives.

\$ ..... [2]

(iii) Cynthia buys 10 eggs and pays with a \$5 note.

Work out how much change she receives.

\$ ..... [1]

(b) Food for the hens costs \$20 for a 40 kg bag.
Amir uses 8 kg of food each week.

(i) Work out how much it costs him to feed the hens each week.

\$ ..... [2]

(ii) Use your answer to **part (a)(ii)** to work out the profit that Amir makes each week.

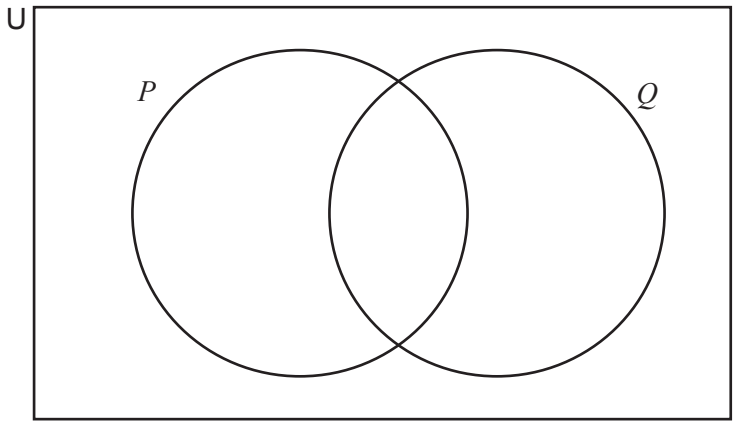
\$ ..... [1]

3 $\mathsf{U} = \{a, b, c, d, e, f, g, h\}$

$P = \{a, c, e, f, g\}$

$Q = \{b, d, f, g\}$

(a) Write the elements of U in their correct position in the Venn diagram.



[2]

(b) Write down an element of P.

..... [1]

(c) Write down the elements of a proper subset of Q.

{ ..... } [1]

(d) Write down the elements of the complement of P.

{ ..... } [1]

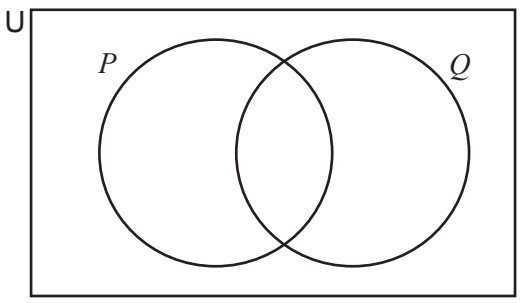
(e) Write down $\mathrm{n}(P \cup Q)'$.

..... [1]

(f) Using set notation, complete the statement.

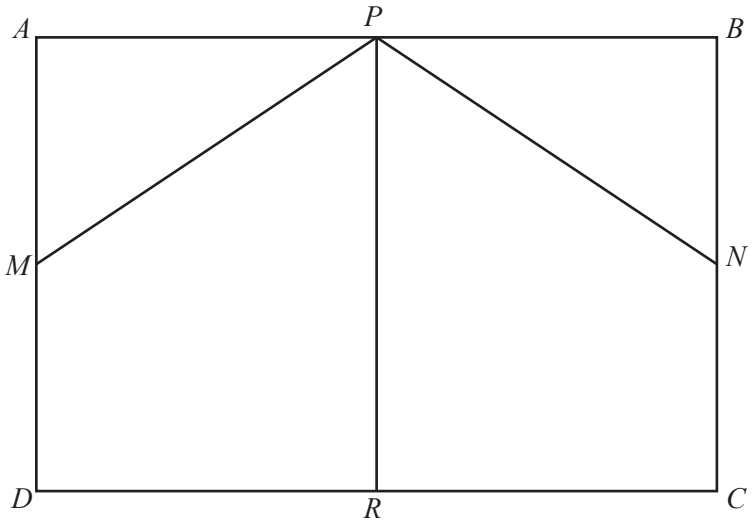
c ..... P [1]

(g) On the diagram below, shade the region $P' \cap Q$.



[1]

4



The diagram shows a rectangle $ABCD$.
The points M, N, P and R are the midpoints of the sides.

(a) On the diagram, label

(i) an acute angle with the letter x, [1]

(ii) a right angle with the letter y, [1]

(iii) an obtuse angle with the letter z. [1]

(b) Using the letters on the diagram, write down

(i) two lines that are parallel,

..... and ..... [1]

(ii) two lines that are perpendicular,

..... and ..... [1]

(iii) two shapes that are congruent.

..... and ..... [1]

5 These are the first four terms of a sequence.

23 16 x 2

The difference between any two consecutive terms is the same.

(a) Find the value of x.

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

(b) Work out the 5th term of this sequence.

..... [1]

(c) Find an expression for the nth term of this sequence.

..... [2]

(d) Is -187 a term in this sequence?
Show how you decide.

[3]

6 **(a)** Appointments with teachers are from 14 15 until 17 25.

(i) Work out the total number of minutes between 14 15 and 17 25.

..... minutes [2]

(ii) Each appointment is for 10 minutes.

Find the maximum number of appointments that can be made for each teacher.

..... [1]

(iii) A teacher has only 12 appointments.

Work out the total number of minutes for his appointments as a percentage of the total possible number of minutes for appointments.

..... % [2]

(b) The table shows the number of appointments for all the teachers.

Teacher	A	B	C	D	E	F	G	H	I	J	K	L	M
Number of appointments	5	12	8	12	11	18	3	16	8	9	14	8	13

For these numbers of appointments, find

(i) the range,

..... [1]

(ii) the mode,

..... [1]

(iii) the median.

..... [1]

(c) One of the 13 teachers is chosen at random.

Find the probability that this teacher has

(i) exactly 12 appointments,

..... [1]

(ii) more than 9 appointments.

..... [1]

7 -3 $\quad -1\frac{1}{7}$ $\quad 0.55$ $\quad \sqrt{2}$ $\quad 2$ $\quad \pi$

(a) From this list write down.

(i) all the integers,

..... [2]

(ii) an irrational number.

..... [1]

(b) Use numbers from the list to complete the following statement.

$\mathbb{Q} = \{$ .....$\}$ [2]

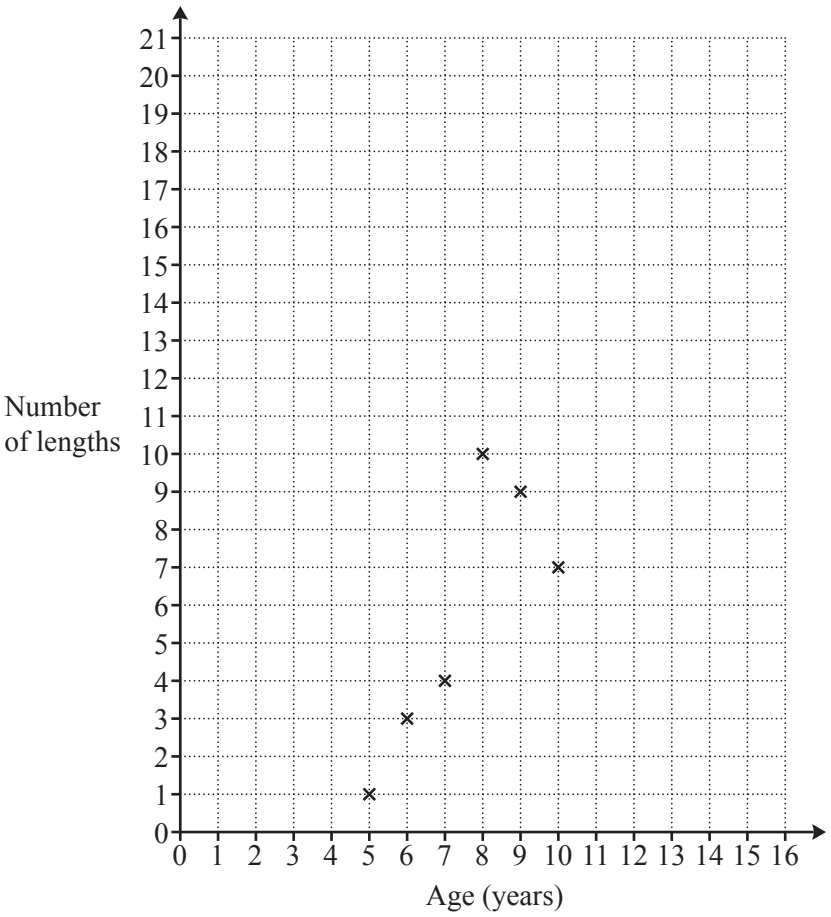
(c) Write 0.55 as a fraction in its simplest form.

..... [2]

8 Ten students of different ages record the number of lengths of a pool they can swim.

Age (years)	5	6	7	8	9	10	12	13	14	15
Number of lengths	1	3	4	10	9	7	14	15	18	20

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



[2]

(b) What type of correlation is shown in the diagram?

..... [1]

(c) Calculate

(i) the mean of the ages,

..... years [1]

(ii) the mean of the number of lengths.

..... [1]

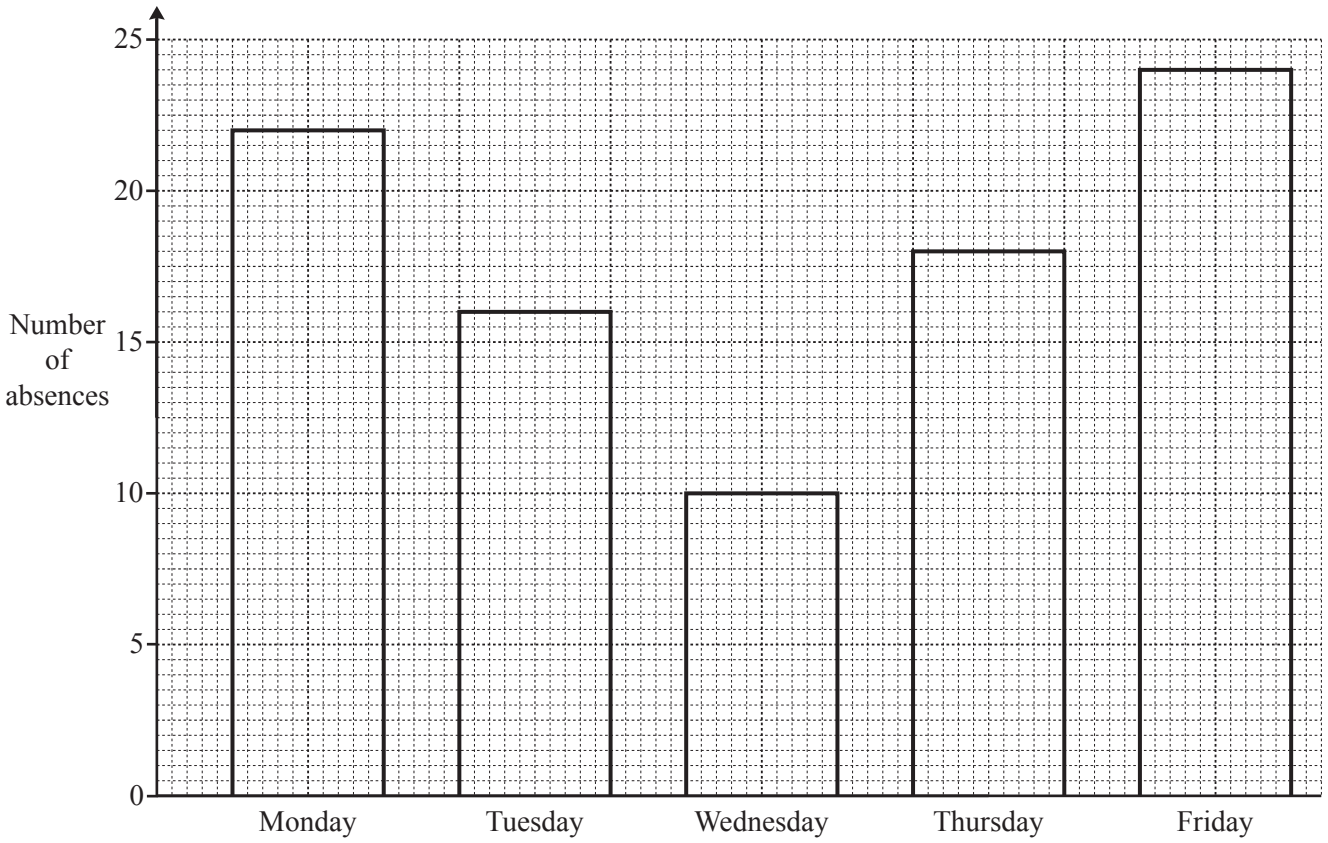
(d) On the scatter diagram, plot the mean point. [1]

(e) On the scatter diagram, draw a line of best fit by eye. [2]

(f) Use your line of best fit to estimate the number of **complete** lengths a student of age 11 years can swim.

..... [2]

9 Clarissa records the number of students absent from school each day.
The results for one week are shown in the bar chart.



(a) Work out the total number of absences during the five days.

..... [1]

(b) Write down which day had the most students absent.

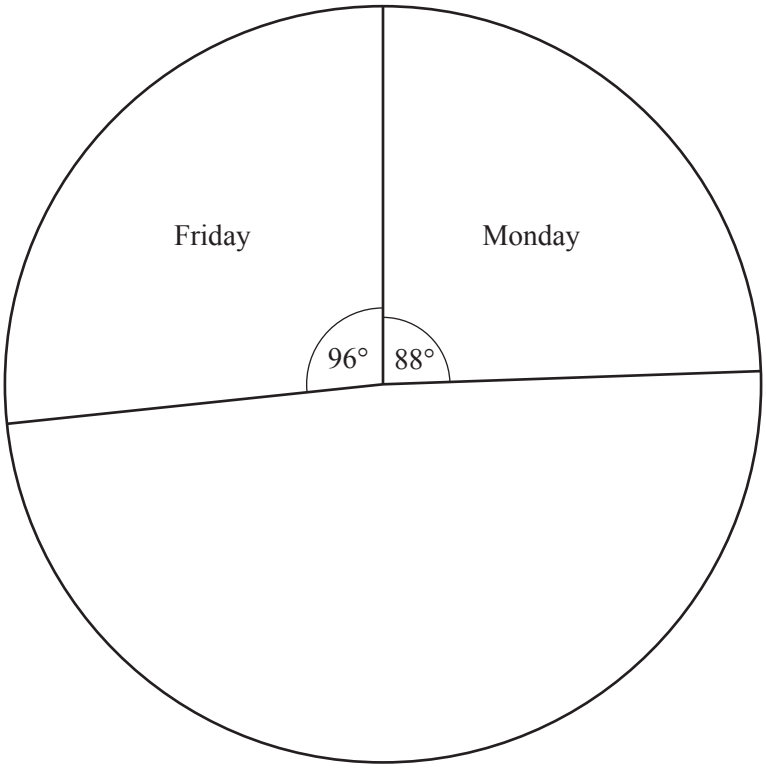
..... [1]

(c) Clarissa decides to draw a pie chart to show this information.

(i) Show, using a calculation, that the sector angle for Monday is 88°.

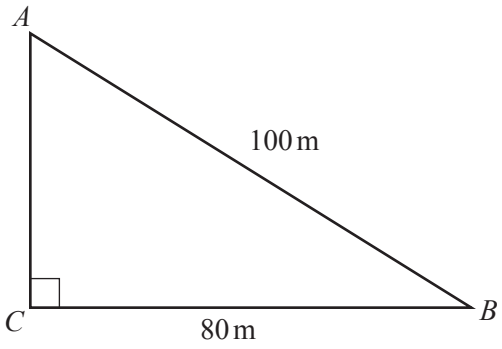
[1]

(ii) Complete the pie chart.
Label each sector clearly.



[3]

10



NOT TO SCALE

A track is in the shape of a right-angled triangle.
$AB = 100$ m and $BC = 80$ m.

(a) Find the length of AC.

$AC =$ ..... m [3]

(b) Find the total length of the track.

..... m [1]

(c) Use trigonometry to find the size of angle ABC.

Angle $ABC =$ ..... [2]

(d) Margriet jogs around the track at an average speed of 9 km/h.

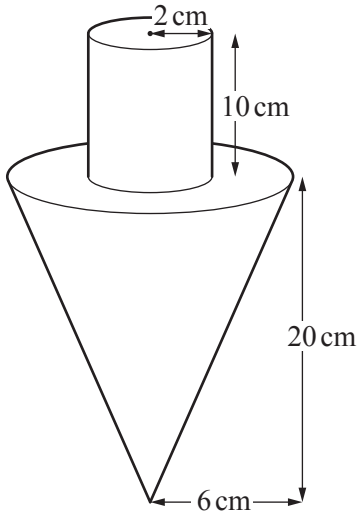
(i) Change 9 km/h to metres/minute.

..... metres/minute [2]

(ii) Calculate the number of minutes it takes her to jog around the track 5 times.

..... minutes [2]

11



NOT TO SCALE

The diagram shows a wooden spinning top in the shape of a cone with a cylinder on top.
The cone has radius 6 cm and height 20 cm.
The cylinder has radius 2 cm and height 10 cm.

(a) Find the total volume of the spinning top.

..... cm^3 [3]

(b) (i) Find the length of the slant height of the cone.

..... cm [2]

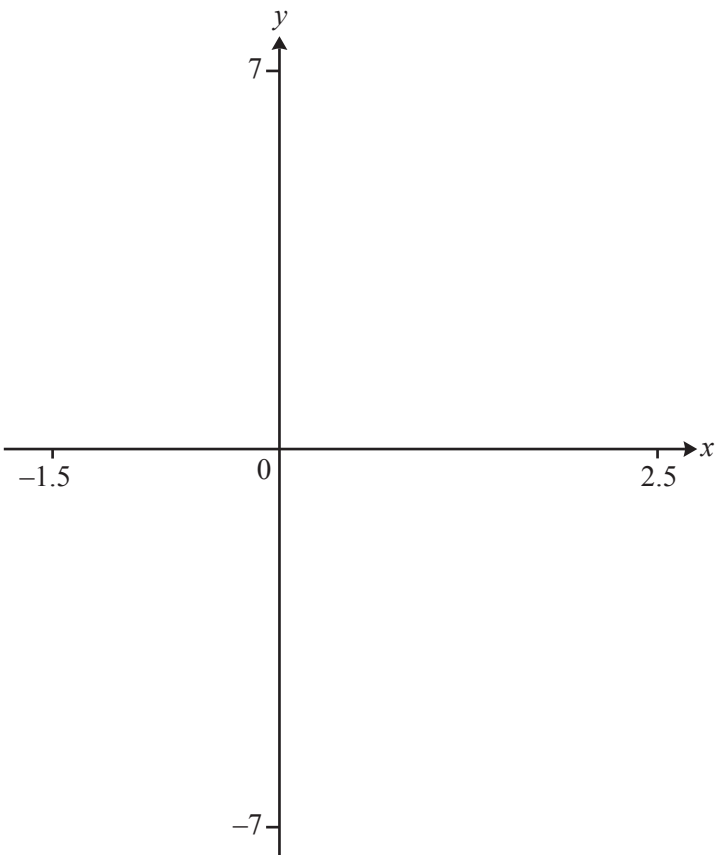
(ii) The **curved** surface area of the cone is painted red.

Find the area painted red.

..... cm^2 [2]

Question 12 is printed on the next page.

12



$f(x) = 2x^3 - 3x^2 - 3x + 2$

(a) On the diagram, sketch the graph of $y = f(x)$ for $-1.5 \leqslant x \leqslant 2.5$. [2]

(b) Find the x co-ordinate of each point where the curve cuts the x-axis.

$x =$ ..... and $x =$ ..... and $x =$ ..... [3]

(c) Find the y co-ordinate of the point where the curve cuts the y-axis.

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

(d) Find the co-ordinates of the local maximum point.

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