Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/33**

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 **15** printed pages and **1** blank page.

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)** A bar of chocolate costs \$0.80 .
Jenny buys 5 of these bars of chocolate.

(i) How much does Jenny pay for these 5 bars of chocolate?

\$ ..... [1]

(ii) Find how much change she receives from \$5.

\$ ..... [1]

(iii) One day there is a special offer on these bars of chocolate.

Buy 2 bars and get 1 extra bar free.

Chris wants 15 bars of chocolate.

Find how much he pays using the special offer.

\$ ..... [2]

(iv) Chris shares these 15 bars between himself and his brother in the ratio 3 : 2.

Find how many bars his brother receives.

..... [2]

(b) Asli buys 3 slices of pizza and 1 salad for \$2.10 .
Arend buys 2 slices of pizza and 2 salads for \$2.20 .

Find the cost of 1 slice of pizza and the cost of 1 salad.
Show all your working.

1 slice of pizza = \$ .....

1 salad = \$ ..... [4]

2 **(a)** **(i)** Write the number three million two thousand and one in figures.

..... [1]

(ii) Work out $10 - 2 \times 6$.

..... [1]

(iii) Find the value of $\sqrt{125.44}$.

..... [1]

(b) Complete the list of factors of 20.

1, ... , ... , ... , ... , 20 [2]

(c) **(i)** Calculate 6.1×3.4^2, giving your answer as a decimal.
Write down your full calculator display.

..... [1]

(ii) Give your answer to **part (c)(i)** correct to 2 decimal places.

..... [1]

(iii) Give your answer to **part (c)(i)** correct to 2 significant figures.

..... [1]

3 **(a)** Simplify.

$5a + 9b - 2a + 2b$

..... [2]

(b) $R = 6M + 2N$

(i) Find R when $M = -3$ and $N = 5$.

..... [2]

(ii) Find M when $R = 26$ and $N = 4$.

..... [2]

(c) Solve.

$3x = 6x + 15$

..... [2]

(d) Factorise completely.

$3a^2 - 12ab$

..... [2]

(e) Simplify.

$4x^2y \times 2x^3y^2$

..... [2]

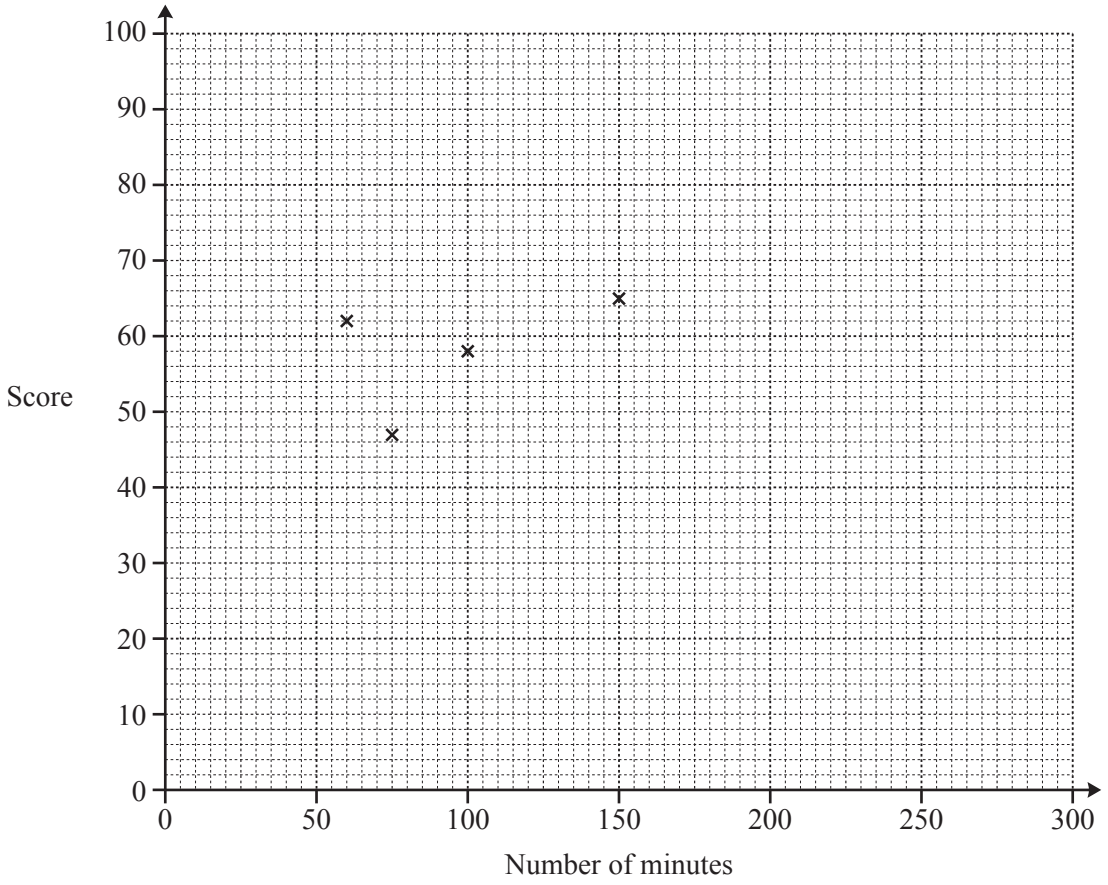
4 Eight friends were asked these questions.

- How many minutes did you spend revising for the mathematics test?
- What was your test score?

The results are shown in the table.

Number of minutes	60	75	100	150	180	220	270	300
Score	62	47	58	65	62	81	90	75

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



[2]

(b) Find

(i) the mean number of minutes spent revising,

..... [1]

(ii) the mean mark scored on the mathematics test.

..... [1]

(c) **(i)** Plot the mean point on the scatter graph. [1]

(ii) Draw a line of best fit by eye on the scatter graph. [2]

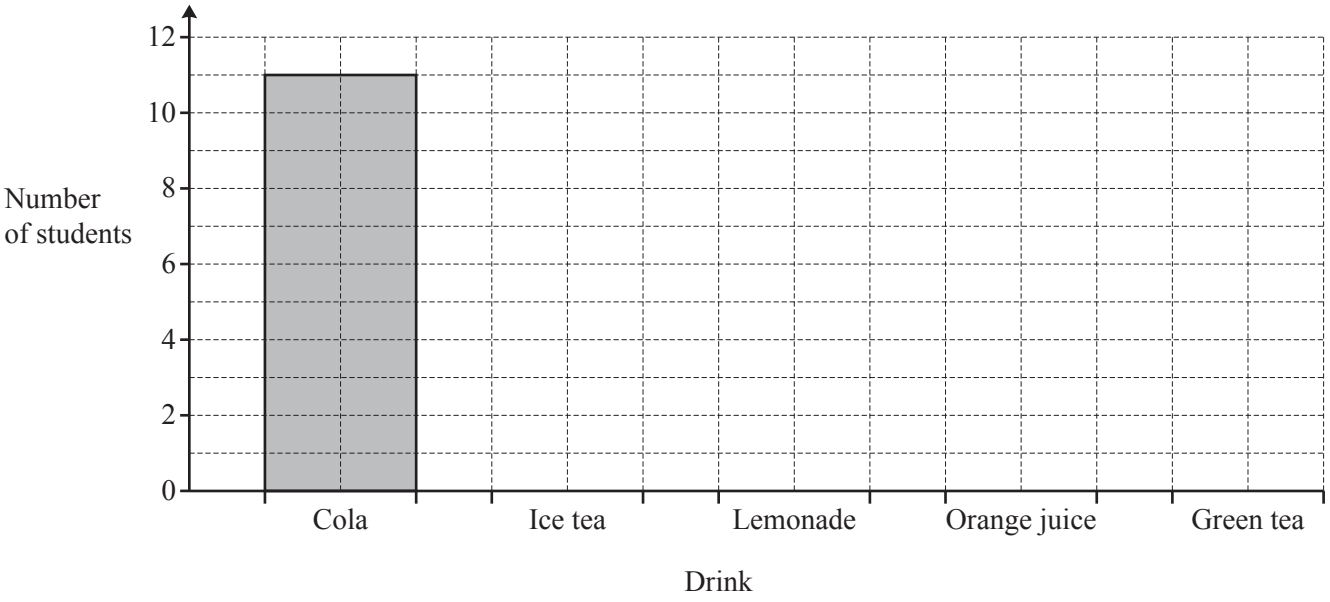
(iii) Use your line of best fit to find an estimate of the mark scored on the mathematics test by a student who spent 200 minutes revising.

..... [1]

5 30 students were asked which drink they liked best.
The results are shown in the table.

Drink	Cola	Ice tea	Lemonade	Orange juice	Green tea
Number of students	11	8	5	4	2

(a) Complete the bar chart.



[2]

(b) Find the probability that one of these 30 students, chosen at random, likes

(i) ice tea best,

..... [1]

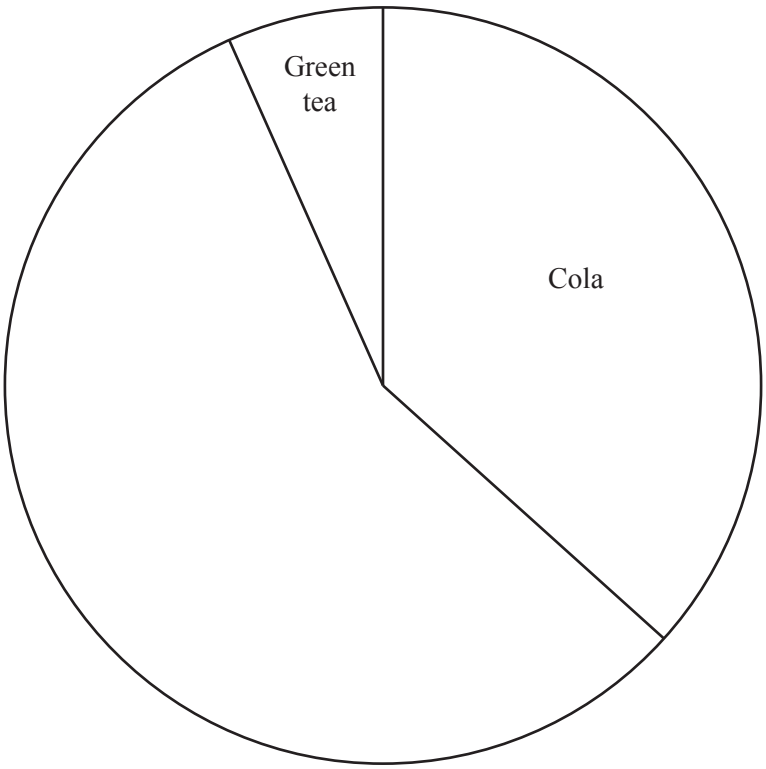
(ii) orange juice or green tea best,

..... [1]

(iii) coffee best.

..... [1]

(c) Complete the pie chart to show the results in the table.



[3]

6 The distance from Breda to Amsterdam is 105 km.

(a) A train from Breda to Amsterdam takes 35 **minutes** to complete the journey.

Calculate the average speed of the train in km/h.

..... km/h [2]

(b) Another train from Breda to Amsterdam travels at an average speed of 84 km/h.

Find the time taken for this train to travel from Breda to Amsterdam.
Give your answer in hours and minutes.

..... hours ..... minutes [2]

7 Suyeon asks each of 23 students in her class to count the number of steps in their house.
The results are listed below.

23	12	16	23	18	46	32	35	15	21	16	42
41	18	34	26	41	47	23	48	23	33	37	

(a) Complete the ordered stem and leaf diagram to show this information.

1	2
2	
3	
4	

Key: ..... | ..... represents .....

[3]

(b) Find

(i) the mode,

..... [1]

(ii) the median,

..... [1]

(iii) the interquartile range,

..... [2]

(iv) the mean.

..... [1]

8 **(a)** Write $\frac{43}{200}$ as a decimal.

..... [1]

(b) Write the following fractions in order, starting with the smallest.

$$\frac{13}{50} \qquad \frac{11}{40} \qquad 1\frac{1}{4} \qquad \frac{43}{200}$$

..... , ... , ... , ... [1]
smallest

(c) $\frac{13}{50} = \frac{x}{100}$

Find the value of x.

$x =$ ..... [1]

(d) Write $\frac{11}{40}$ as a percentage.

..... % [1]

(e) Calculate, giving each answer as a fraction.

(i) $\frac{13}{50} + \frac{43}{200}$

..... [1]

(ii) $\frac{11}{40} \div \frac{13}{50}$

..... [1]

(iii) $1\frac{1}{4} \times \frac{43}{200}$

..... [1]

9 These are the first four terms of a sequence.

64 81 98 115

(a) Write down the next two terms in this sequence.

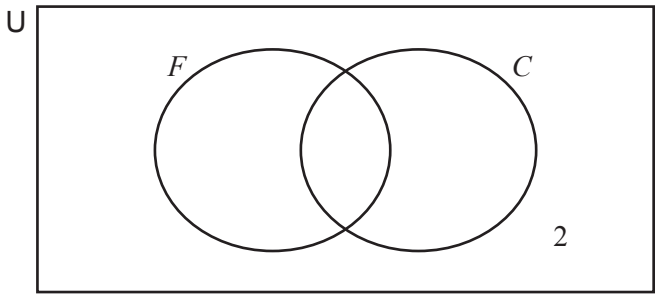
..... , ... [2]

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

..... [2]

10 Alperen asks 30 students if they like fish (F) or cheese (C).
19 like fish, 24 like cheese and 2 like neither fish nor cheese.

(a) Complete the Venn diagram.



[2]

(b) Write down the number of students who like fish or cheese but not both.

..... [1]

(c) Shade the region $F \cap C'$.

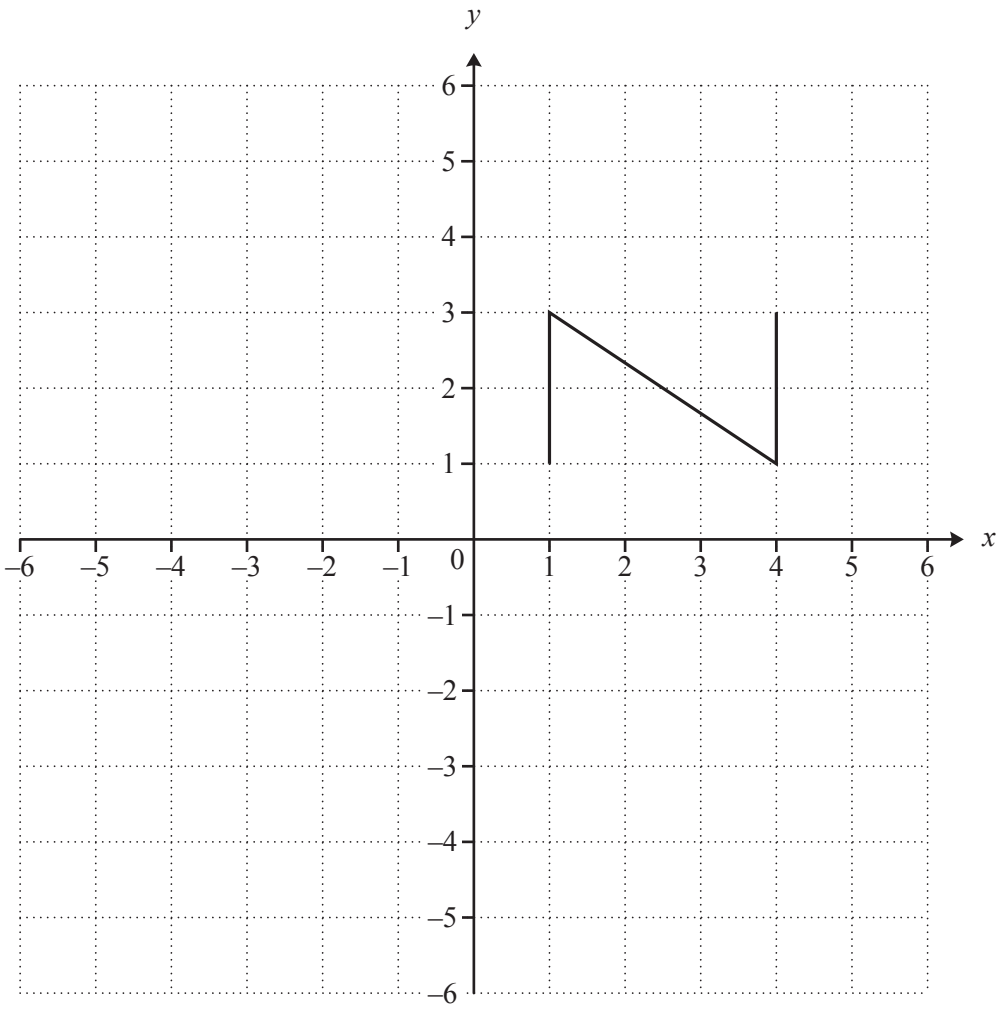
[1]

(d) One student is chosen at random.

Find the probability that this student likes cheese only.

..... [1]

11



On the grid, draw the image of

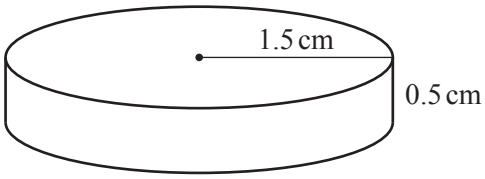
(a) shape N after a reflection in the y-axis, [1]

(b) shape N after a rotation of 90° clockwise about the origin, [2]

(c) shape N after a translation of $\begin{pmatrix} -6 \\ -5 \end{pmatrix}$. [2]

12

NOT TO
SCALE



Tamay has 15 identical silver coins.
Each coin is a cylinder of radius 1.5 cm and height 0.5 cm.

(a) Find the total surface area of **one** coin.

..... cm^2 [3]

(b) **(i)** Find the total volume of all 15 coins.

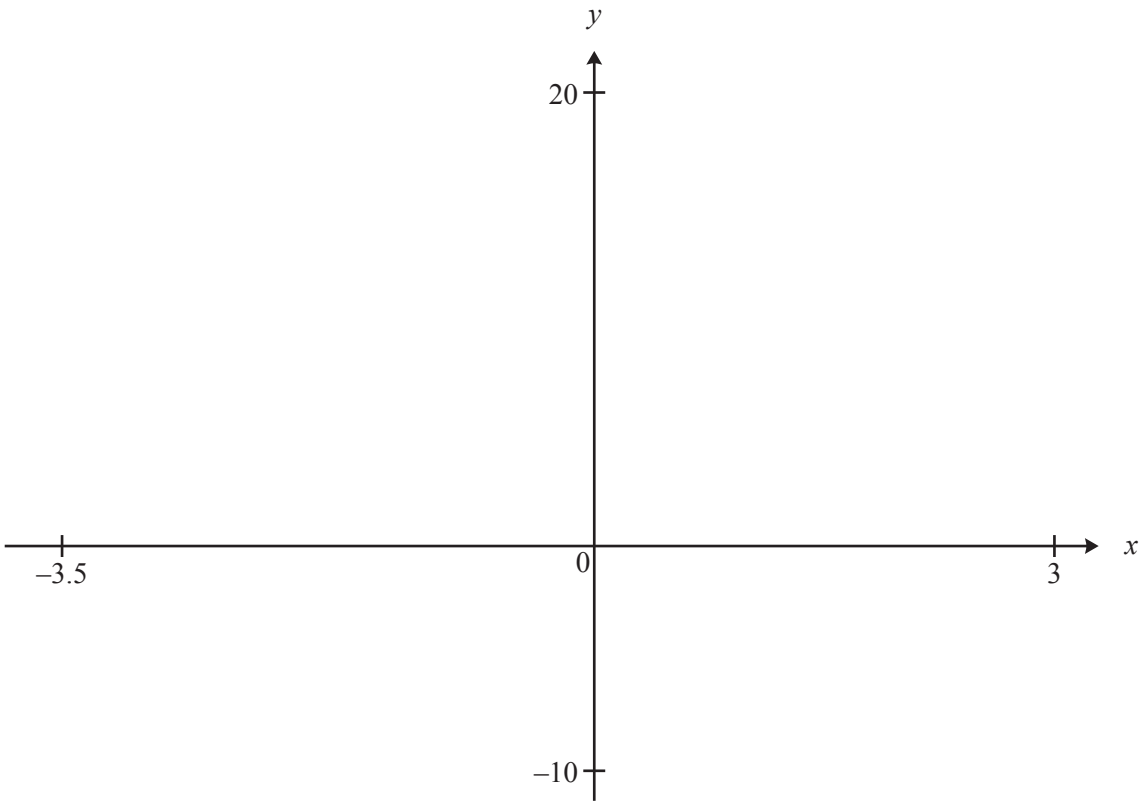
..... cm^3 [2]

(ii) The 15 coins are melted down to make one large cylinder of height 3 cm.

Calculate the radius of this cylinder.
Give your answer correct to 1 decimal place.

..... cm [3]

13



$\mathrm{f}(x) = x^3 + x^2 - 6x$

(a) On the diagram, sketch the graph of $y = \mathrm{f}(x)$ for $-3.5 \leqslant x \leqslant 3$. [2]

(b) Write down the co-ordinates of the point where the graph crosses the y-axis.

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

(c) Write down the co-ordinates of the points where the graph crosses the x-axis.

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

(d) Write down the co-ordinates of the local minimum.

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

(e) On the same diagram, sketch and label clearly the graph of

(i) $y = \mathrm{f}(x) + 2$, [1]

(ii) $y = \mathrm{f}(x - 1)$. [1]

BLANK PAGE