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CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/03

Paper 3 (Core)

For examination from 2020

SPECIMEN PAPER

1 hour 45 minutes

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π , use your calculator value.

INFORMATION

- The total mark for this paper is 96.
- The number of marks for each question or part question is shown in brackets [].

This document has **16** pages. Blank pages are indicated.

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 32 652

(i) correct to the nearest 10,

..... [1]

(ii) correct to the nearest 100.

..... [1]

(b) Write 62.584 correct to 1 decimal place.

..... [1]

(c) Calculate 4.8^4 .

..... [1]

(d) Find $\sqrt[3]{216}$.

..... [1]

(e) Find the highest common factor (HCF) of 18 and 45.

..... [1]

(f) Find the lowest common multiple (LCM) of 6 and 8.

..... [1]

(g) Divide 442 in the ratio 8 : 9.

..... : [2]

(h) Sem buys 7 hamburgers each costing \$1.20 .

Find how much change he receives from \$10.

\$ [2]

- 2 (a) Write 0.75 as a fraction.

..... [1]

- (b) Write $\frac{2}{3}$ as a percentage, giving your answer correct to 4 significant figures.

.....% [2]

- (c) Write 48% as a fraction in its lowest terms.

..... [2]

- (d) The price of a jacket is \$96.
The price is reduced by 20%.

Find the new price of the jacket.

\$ [2]

- (e) \$800 is invested at a rate of 3% per year compound interest.

Find the value of the investment after 5 years.

\$ [3]

- 3** A special die has 10 faces numbered 1 to 10.
When the die is rolled it is equally likely to land on any face.

Find the probability that the die lands on

- (a)** an even number,

..... [1]

- (b)** a prime number,

..... [1]

- (c)** 11,

..... [1]

- (d)** a square number less than 5.

..... [1]

- 4 Jacinta asks some students in her class which colour they prefer. The results are in the table.

Colour	Number of students
Brown	1
Green	4
Black	8
Pink	12
Blue	15

- (a) Calculate the total number of students.

..... [1]

- (b) Write down the most popular colour.

..... [1]

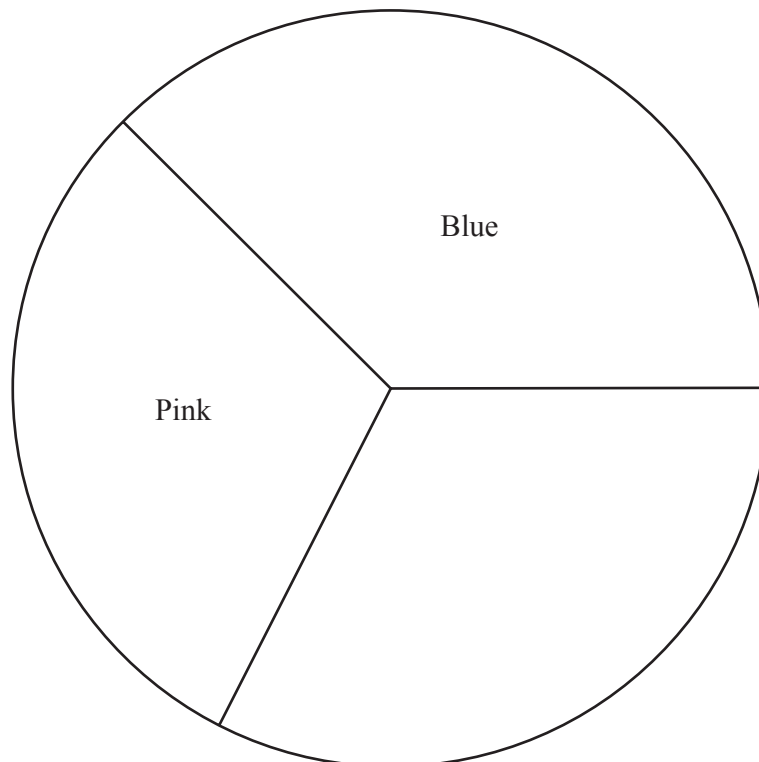
(c) Jacinta wants to draw a pie chart for these results.

Colour	Number of students	Sector angle in pie chart
Brown	1	
Green	4	
Black	8	
Pink	12	108°
Blue	15	135°

(i) Complete the table.

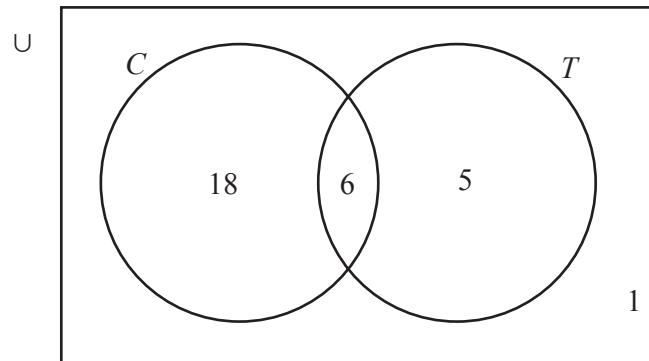
[2]

(ii) Complete the pie chart to show this information.
Two sectors have been drawn for you.



[2]

- 5 HanRa asked 30 students if they ate cereal (C) or toast (T) for breakfast. The information is shown in the Venn diagram.



Write down the number of students in

- (a) $C \cap T$,

..... [1]

- (b) C ,

..... [1]

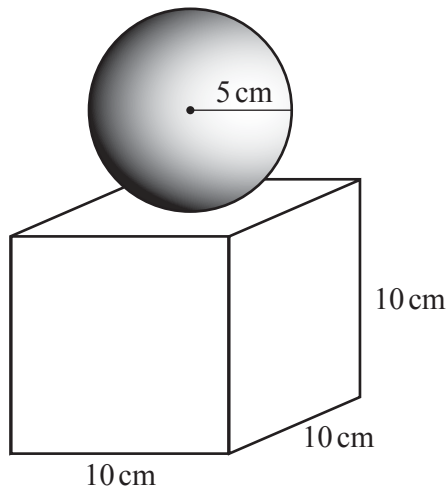
- (c) $(C \cup T)'$,

..... [1]

- (d) $T \cup C'$.

..... [1]

NOT TO SCALE



A trophy is in the shape of a cube of side 10 cm with a sphere of radius 5 cm on top.

(a) Find the surface area of the cube.

.....cm² [2]

(b) Find the surface area of the sphere.

.....cm² [2]

(c) Find the total **volume** of the trophy.

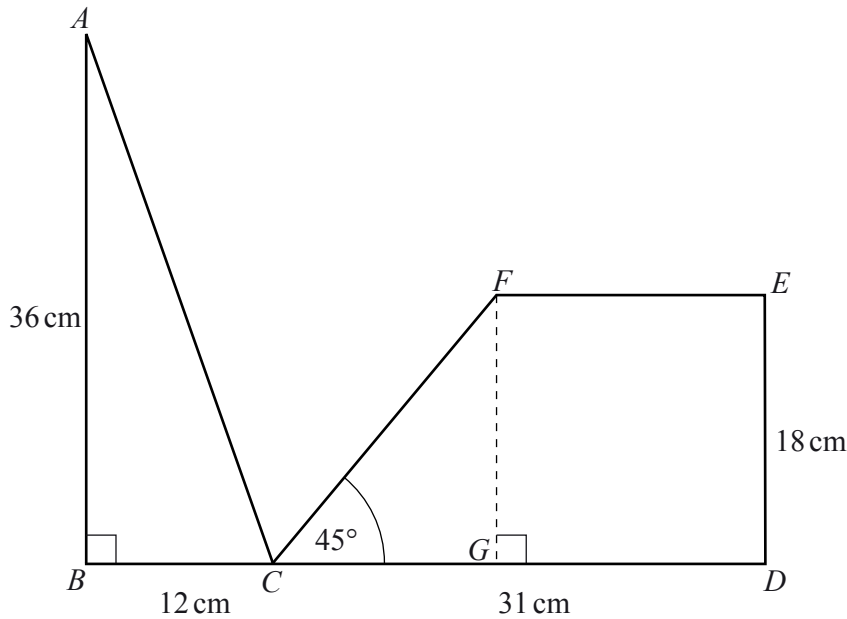
.....cm³ [4]

The trophy is made from metal that costs 4 cents per cm³.

(d) Find the cost of the metal used to make the trophy.
Give your answer in dollars.

\$ [2]

7



NOT TO SCALE

The diagram shows the design for a company logo.
 The logo is made up of a triangle ABC and a trapezium $CDEF$.
 $BCGD$ is a straight line and angle $FCD = 45^\circ$.

$AB = 36$ cm, $BC = 12$ cm, $CD = 31$ cm and $ED = 18$ cm.

(a) Find the size of angle CFE .

Angle $CFE = \dots\dots\dots$ [1]

(b) Use trigonometry to calculate the size of angle BCA .

Angle $BCA = \dots\dots\dots$ [2]

(c) Use Pythagoras' Theorem to find the length of AC .

$AC = \dots\dots\dots$ cm [2]

(d) Calculate the length of CF .

$CF = \dots\dots\dots$ cm [3]

(e) (i) Explain why $EF = 13$ cm.

[2]

(ii) Find the total perimeter of the logo.

$\dots\dots\dots$ cm [1]

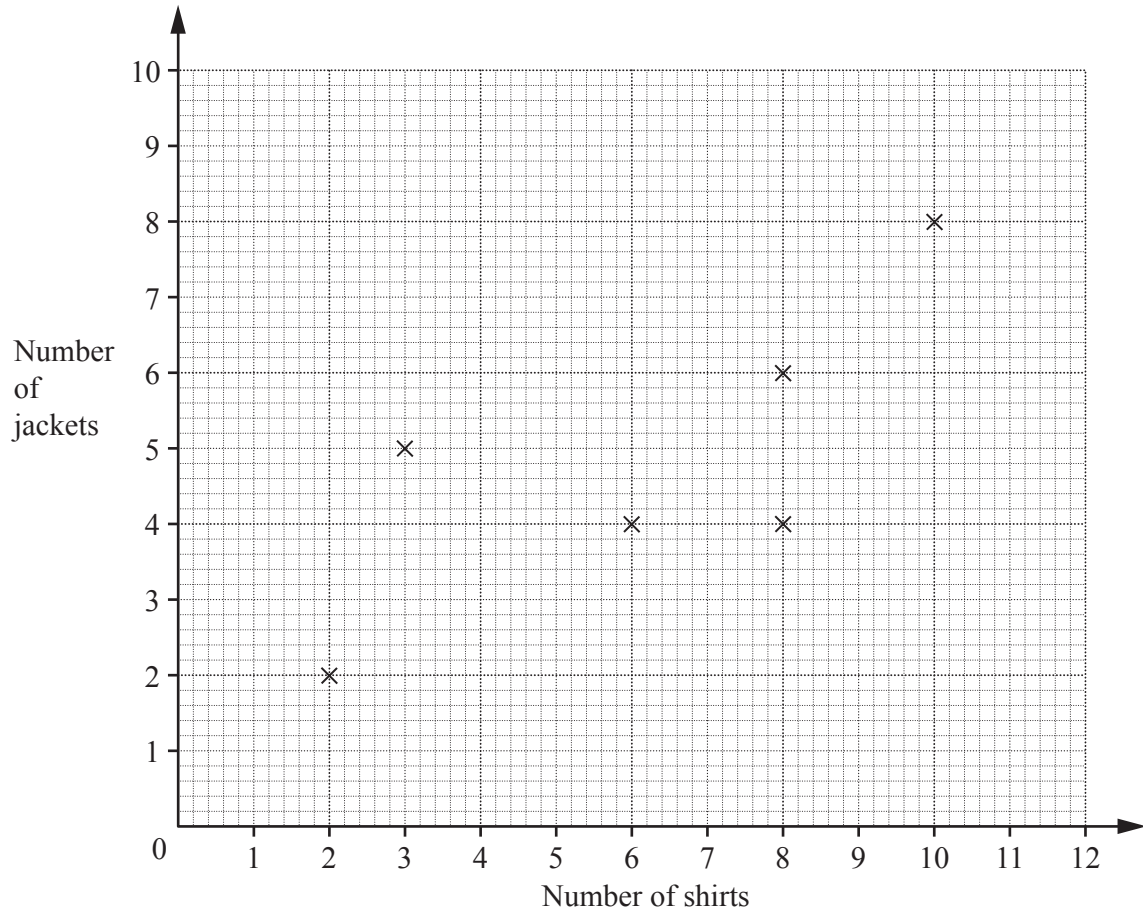
(f) Calculate the total area of the logo.

$\dots\dots\dots$ cm² [3]

8 The table shows the number of shirts and the number of jackets owned by 12 students.

Shirts	3	6	2	8	8	10	6	5	9	8	4	12
Jackets	5	4	2	4	6	8	5	4	6	5	4	7

- (a) Complete the scatter diagram.
The first 6 points have been plotted for you.



[2]

- (b) Write down the type of correlation shown by the scatter diagram.

..... [1]

(c) (i) Find the mean number of shirts.

..... [1]

(ii) Find the mean number of jackets.

..... [1]

(iii) On the diagram, plot the mean point.

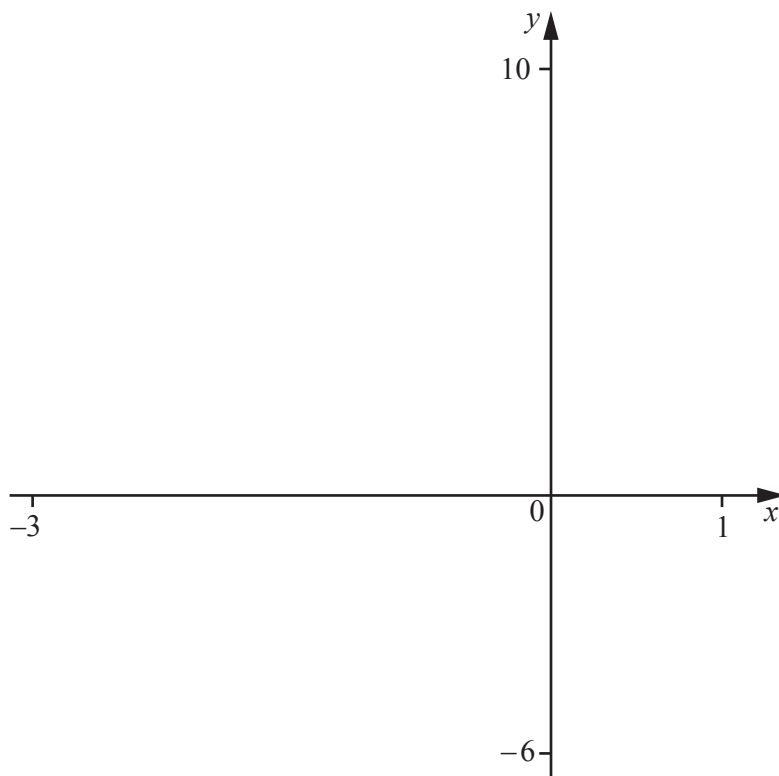
[1]

(d) On the diagram, draw a line of best fit by eye.

[2]

(e) Use your line of best fit to estimate the number of jackets for a student who has 7 shirts.

..... [1]



$$f(x) = 6 - 5x - 3x^2$$

(a) On the diagram, sketch the graph of $y = f(x)$ for $-3 \leq x \leq 1$. [2]

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

$y = \dots\dots\dots$ [1]

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

$x = \dots\dots\dots$ and $x = \dots\dots\dots$ [2]

(d) Find the coordinates of the local maximum point.

($\dots\dots\dots$, $\dots\dots\dots$) [1]

(e) $g(x) = 2x + 4$

On the same diagram, sketch the graph of $y = g(x)$. [2]

(f) Find the coordinates of the points of intersection of $f(x)$ and $g(x)$.

($\dots\dots\dots$, $\dots\dots\dots$) and ($\dots\dots\dots$, $\dots\dots\dots$) [2]

10 (a) Solve.

(i) $5x + 6 = -4$

..... [2]

(ii) $6x + 3 < 21$

..... [2]

(b) Simplify.

(i) $s^3 \times s^4$

..... [1]

(ii) $(t^2)^4$

..... [1]

(iii) $18r^3 \div 3r$

..... [2]

(c) Expand and simplify.

$$4(x - 3) + 3(2x + 1)$$

..... [2]

(d) Factorise completely.

$$15y - 3y^2$$

..... [2]

Question 11 is printed on the next page.

- 11 (a) Ahmed cycles 15 kilometres in 50 minutes.

Find his average speed in kilometres per hour.

..... km/h [3]

- (b) George runs 15 kilometres at an average speed of 12 kilometres per hour.

Find how many minutes it takes George to run the 15 kilometres.

..... min [3]

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