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CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/21

Paper 2 (Extended)

October/November 2021

45 minutes

You must answer on the question paper.

You will need: Geometrical instruments

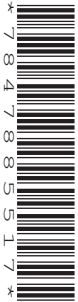
INSTRUCTIONS

- 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.
- Calculators must **not** be used in this paper.
- You may use tracing paper.
- You must show all necessary working clearly and you will be given marks for correct methods even if your answer is incorrect.
- All answers should be given in their simplest form.

INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [].

This document has **12** pages. Any blank pages are indicated.



Formula List

For the equation $ax^2 + bx + c = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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 . $A = \pi rl$

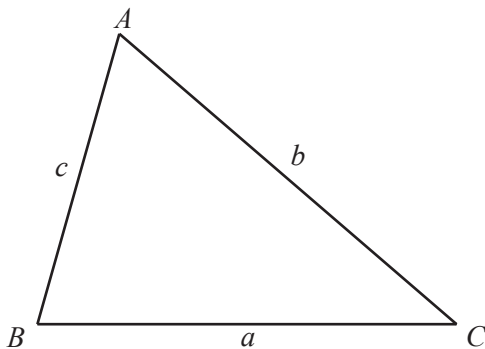
Curved surface area, A , of sphere of radius r . $A = 4\pi r^2$

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



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2}bc \sin A$$

3

Answer **all** the questions.

- 1 (a) Write 4347849 correct to the nearest ten thousand.

..... [1]

- (b) Write 0.0040243 correct to 2 significant figures.

..... [1]

- 2 90 91 92 93 94 95 96 97 98 99

From this list, write down

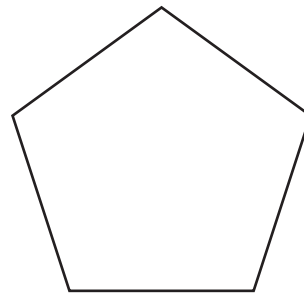
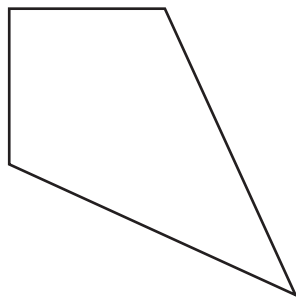
- (a) a prime number,

..... [1]

- (b) a common multiple of 4 and 6.

..... [1]

- 3 Draw **all** the lines of symmetry on each of these shapes.

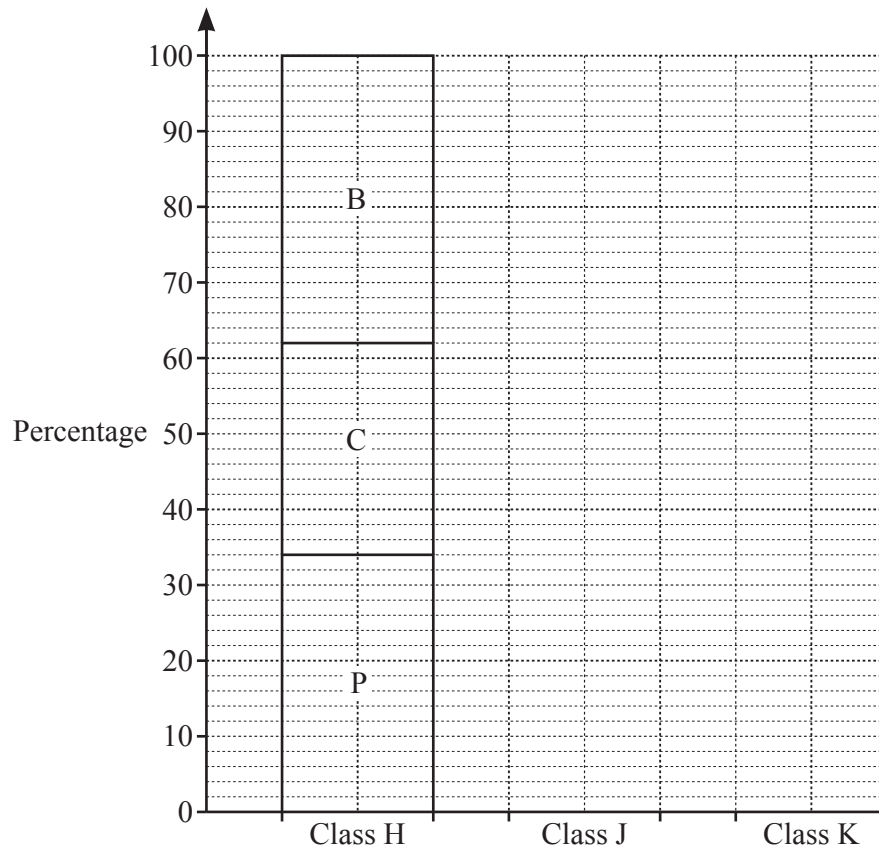


[2]

- 4 The table shows the percentage of students in each of three classes who study physics, chemistry and biology.

	Physics (P)	Chemistry (C)	Biology (B)
Class H	34	28	38
Class J	24	18	58
Class K	46	32	22

Complete the compound bar chart to show this information.



[3]

5 Solve.

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

$$x = \dots\dots\dots [3]$$

6 (a) Write 0.000 058 6 in standard form.

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

(b) $(2 \times 10^a) \div (8 \times 10^b) = k \times 10^n$ where $1 \leq k < 10$.

(i) Find the value of k .

$$k = \dots\dots\dots [1]$$

(ii) Write an expression for n in terms of a and b .

$$n = \dots\dots\dots [1]$$

- 7 Mia carries out a survey in a school to find out what students will do when they leave school. These are her results.

	University	Job	Training	Travelling	Total
Frequency	112	43	27	18	200

- (a) Find the relative frequency of university.

..... [1]

- (b) There are 1600 students in this school.

- (i) Explain why the result in **part (a)** is a reasonable estimate of the probability that a student from this school will go to university.

..... [1]

- (ii) Calculate an estimate for the number of students in this school who will go travelling.

..... [2]

- 8 Solve the simultaneous equations.

$$3x - 2y = 12$$

$$5x + y = 7$$

$$x = \dots\dots\dots$$

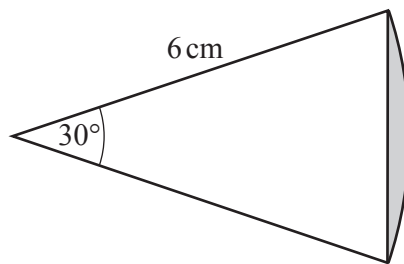
$$y = \dots\dots\dots [3]$$

- 9 y varies inversely as the square of $(x+2)$.
When $x = 4$, $y = 0.5$.

Find y in terms of x .

$$y = \dots\dots\dots [2]$$

10



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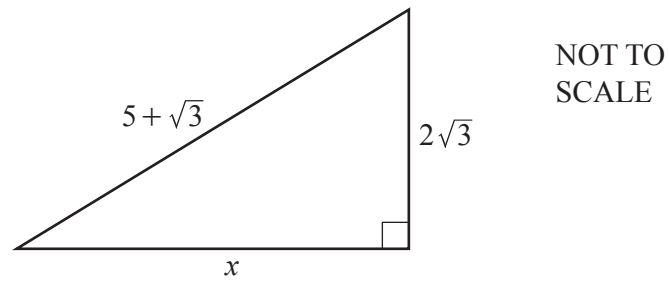
The diagram shows a sector of a circle with radius 6 cm and sector angle 30° .
The area of the shaded segment is $(a\pi - b)\text{cm}^2$.

Find the value of a and the value of b .

$$a = \dots\dots\dots$$

$$b = \dots\dots\dots [3]$$

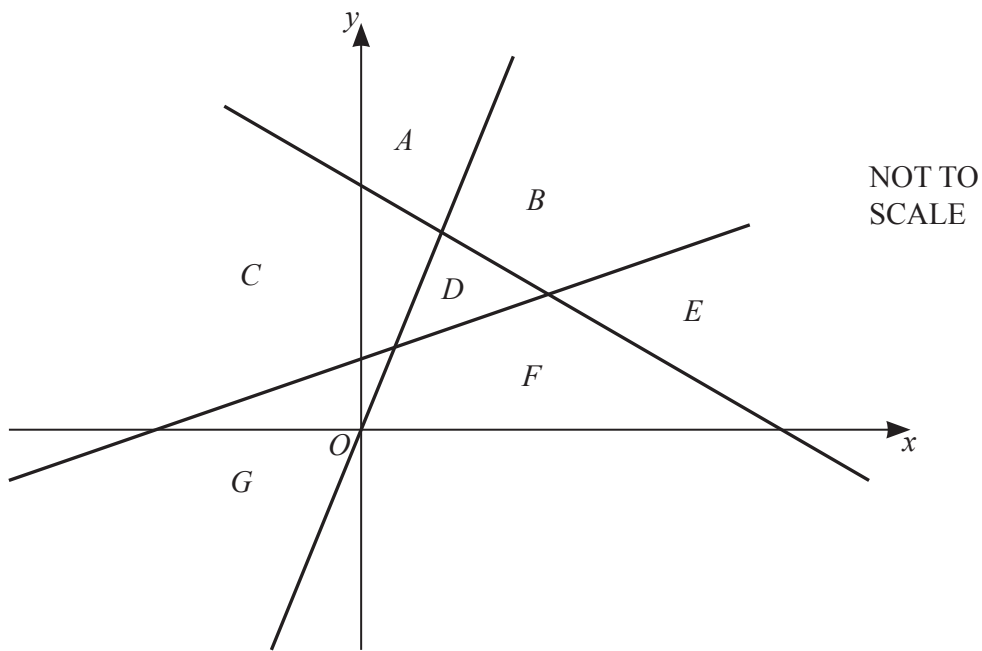
11 In this question all lengths are in centimetres.



Find the value of x^2 .

Give your answer in the form $a + b\sqrt{3}$ where a and b are integers.

$$x^2 = \dots\dots\dots [4]$$



The diagram shows the lines $y = \frac{1}{2}x + 1$, $y = 3x$ and $3x + 4y = 12$.

These lines divide the space into 7 regions, A , B , C , D , E , F , and G .

Write down the letter of the region which is defined by

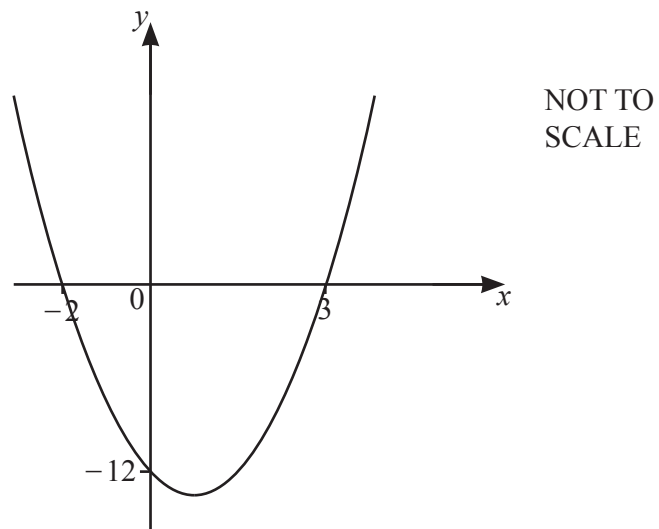
(a) $y \leq \frac{1}{2}x + 1$, $y \leq 3x$ and $3x + 4y \leq 12$,

Region [1]

(b) $y \geq \frac{1}{2}x + 1$, $y \geq 3x$ and $3x + 4y \leq 12$.

Region [1]

13



The equation of the curve is $y = ax^2 + bx - 12$.

Find the value of a and the value of b .

$a = \dots\dots\dots$

$b = \dots\dots\dots$ [3]

14 Solve.

(a) $\log_3 x = 4$

$x = \dots\dots\dots$ [1]

(b) $2 \log x - 3 \log 2 = \log 50$

$x = \dots\dots\dots$ [3]

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