Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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8579531881

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/22**

Paper 2 (Extended) **May/June 2014**

45 minutes

Candidates answer on the Question Paper.

Additional Materials: Geometrical Instruments

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.
CALCULATORS MUST NOT BE USED IN THIS PAPER.
All answers should be given in their simplest form.
You must show all the relevant working to gain full marks and you will be given marks for correct methods 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 40.

This document consists of **10** printed pages and **2** blank pages.

CAMBRIDGE International Examinations

Formula List

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

Curved surface area, A, of cylinder of radius r, height h. $\quad A = 2\pi rh$

Curved surface area, A, of cone of radius r, sloping edge l. $\quad A = \pi rl$

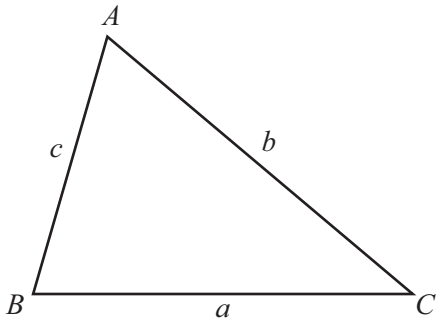
Curved surface area, A, of sphere of radius r. $\quad A = 4\pi r^2$

Volume, V, of pyramid, base area A, height h. $\quad V = \dfrac{1}{3}Ah$

Volume, V, of cylinder of radius r, height h. $\quad V = \pi r^2 h$

Volume, V, of cone of radius r, height h. $\quad V = \dfrac{1}{3}\pi r^2 h$

Volume, V, of sphere of radius r. $\quad V = \dfrac{4}{3}\pi r^3$



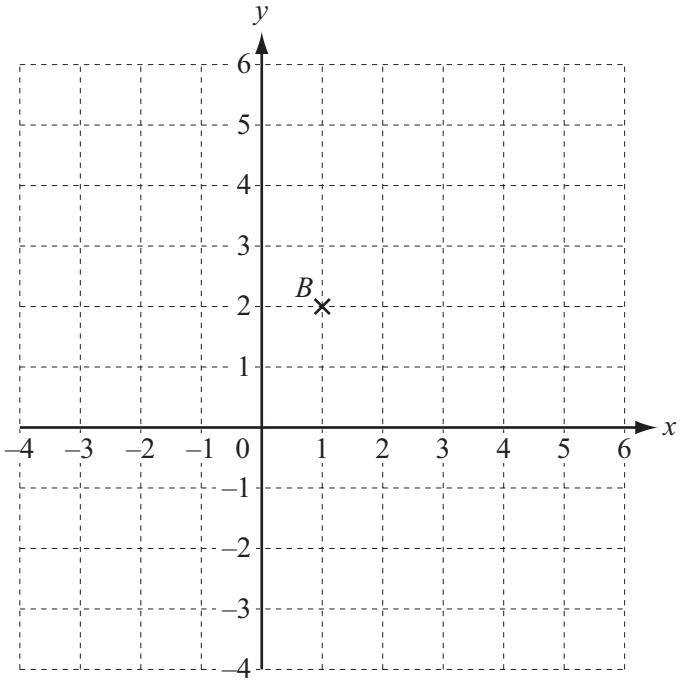
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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

Answer **all** the questions.

1 (a)



B is the point $(1, 2)$ and $\overrightarrow{BC} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$.

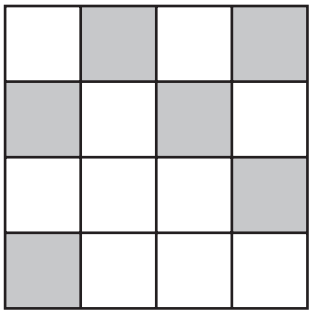
Plot the point C on the grid. [1]

(b) $\mathbf{p} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ $\mathbf{q} = \begin{pmatrix} 4 \\ -1 \end{pmatrix}$.

Write $2\mathbf{p} - \mathbf{q}$ as a column vector.

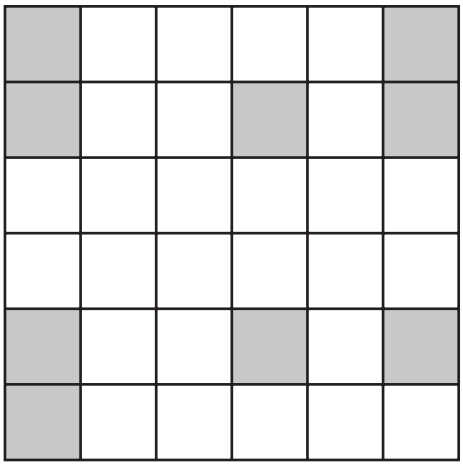
Answer(b) $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

2 **(a)** Shade one small square so that this shape has exactly 1 line of symmetry.



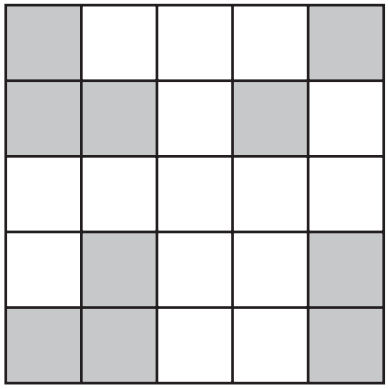
[1]

(b) Shade three small squares so that this shape has exactly 2 lines of symmetry.



[2]

(c) Shade two small squares so that this shape has rotational symmetry of order 4.



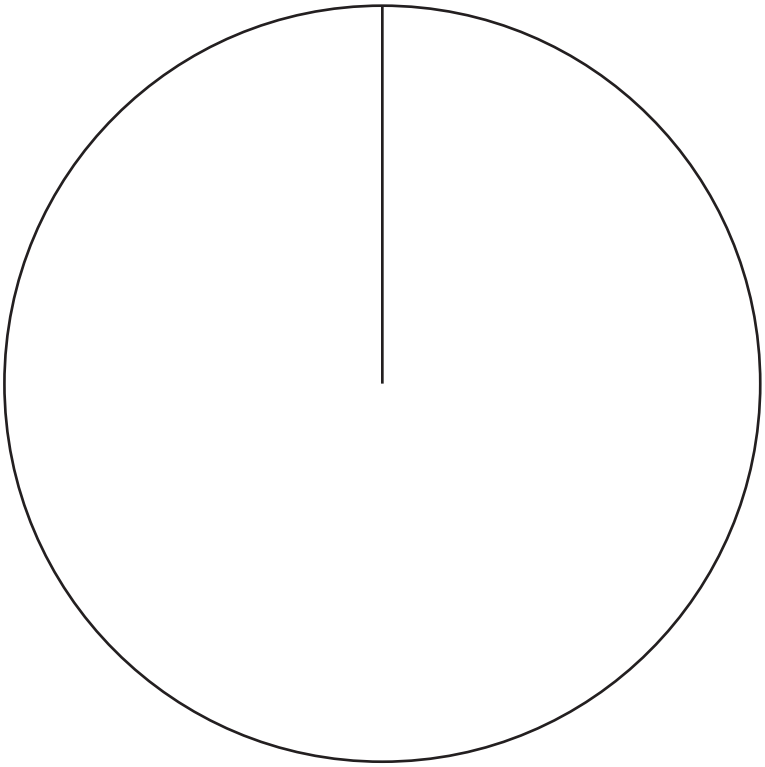
[2]

3 In a year group of a school, students study one subject from art, music or dance.

The table shows the choices of the 180 students.

Subject	Number of students
Art	85
Music	50
Dance	45

Use the circle to draw a pie chart to show this information.



[3]

4 Write each set of numbers in order starting with the smallest.

(a) $\frac{1}{3}$ 0.3 $\sqrt{0.3}$ 0.29 33%

Answer(a) ..... , ... , ... , ... , ... [2]
smallest

(b) $2\sqrt{5}$ $\frac{\sqrt{5}}{2}$ $\left(\sqrt{5}\right)^3$ $\frac{5}{\sqrt{5}}$

Answer(b) ..... , ... , ... , ... [2]
smallest

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5 Expand the brackets and simplify.

(a) $2x^2(3x + 5xy)$

Answer(a) ..... [2]

(b) $(2a - 3b)(a - 2b)$

Answer(b) ..... [3]

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6 $a = 3^4 \times 5^2$ $b = 2^2 \times 3^3 \times 5^2$ $c = 3^2 \times 5^3 \times 7$

(a) Find

(i) $\sqrt{a}$,

Answer(a)(i) ..... [1]

(ii) $\frac{b}{a}$.

Answer(a)(ii) ..... [1]

(b) Leaving your answer as the product of prime factors, find

(i) the highest common factor (HCF) of a, b and c,

Answer(b)(i) ..... [1]

(ii) the lowest common multiple (LCM) of a, b and c.

Answer(b)(ii) ..... [2]

7 Ann, Babar, Chan and Demi each throw the same **biased** die.
They want to find the probability of throwing a six with this die.
They each throw the die a different number of times.

These are their results.

	Ann	Babar	Chan	Demi
Number of throws	200	20	100	500
Number of sixes	60	5	30	200

(a) Complete the table below to show the relative frequencies of their results.
Write your answers as decimals.

	Ann	Babar	Chan	Demi
Relative frequency of throwing a six				

[2]

(b) Give a reason why Demi's result gives the best estimate of the probability of throwing a six with the biased die.

Answer(b) ..... [1]

(c) Estimate the number of times that Demi could expect to get a six if he throws the die 1600 times.

Answer(c) ..... [1]

8 y is proportional to the square root of x.
When $x = 16$, $y = 10$.

(a) Find an equation connecting x and y.

Answer(a) ..... [2]

(b) Find the value of x when $y = 1$.

Answer(b) ..... [2]

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9 Work out the following, giving your answers in standard form.

(a) $(4.6 \times 10^{-5}) + (3 \times 10^{-6})$

Answer(a) ..... [2]

(b) $(4.6 \times 10^{-5}) \times (3 \times 10^{-6})$

Answer(b) ..... [2]

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10 Write $\frac{3}{x+2} - \frac{5}{2x+3}$ as a single fraction in its simplest form.

Answer ..... [3]

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