Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

4212293307

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/23**

Paper 2 (Extended) **May/June 2015**

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 **12** printed 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. $\quad A = \pi rl$

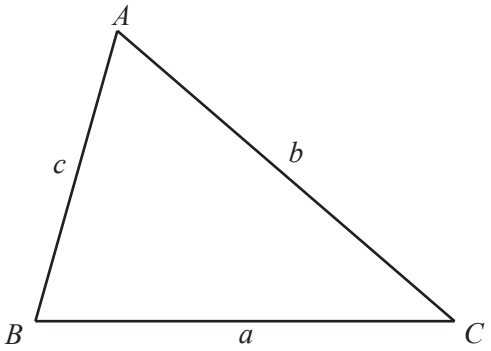
Curved surface area, A, of sphere of radius r. $\quad A = 4\pi r^2$

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

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

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

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



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

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

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

Answer **all** the questions.

1 Round these numbers to 3 significant figures.

(a) 0.000 604 83

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

(b) 6 998 800

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

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2 By rounding each number to 1 significant figure, estimate the value of

$$\frac{0.583 \times 311.6}{1.82 + 10.43}.$$

Show your working.

Answer ..... [2]

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

(a) Find, giving each answer as the product of prime factors,

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

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

(ii) $\sqrt{b}$.

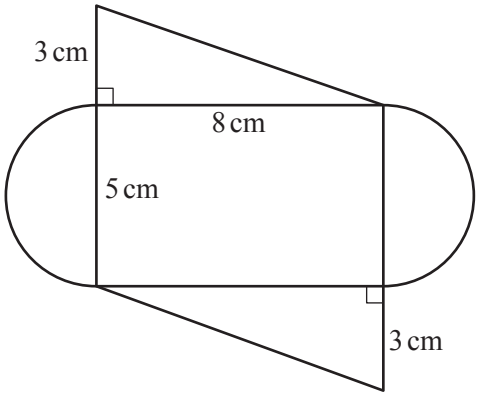
Answer(a)(ii) ..... [1]

(b) ap is a cube number.

Find the smallest integer value of p.

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

4



NOT TO SCALE

The diagram shows a rectangle, two semicircles and two right-angled triangles.

(a) Find the total area of the shape.
Give your answer in the form $a + b\pi$.

Answer(a) ..... cm^2 [3]

(b) Describe fully the symmetry of the shape.

Answer(b) .....

..... [2]

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5 Solve.

$$5(x + 2) < 2(4x - 7)$$

Answer ..... [3]

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6 François and George each ask a sample of students at their college how they travel to college.

These are their results.

	Walk	Cycle	Bus	Train	Car	Total number of students
François	7	3	4	1	5	20
George	46	24	44	11	25	150

(a) Explain why George's results will give the better estimates of the probabilities of the different types of travel.

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

(b) A student is selected at random.

(i) Use George's results to estimate the probability that the student cycles to college.

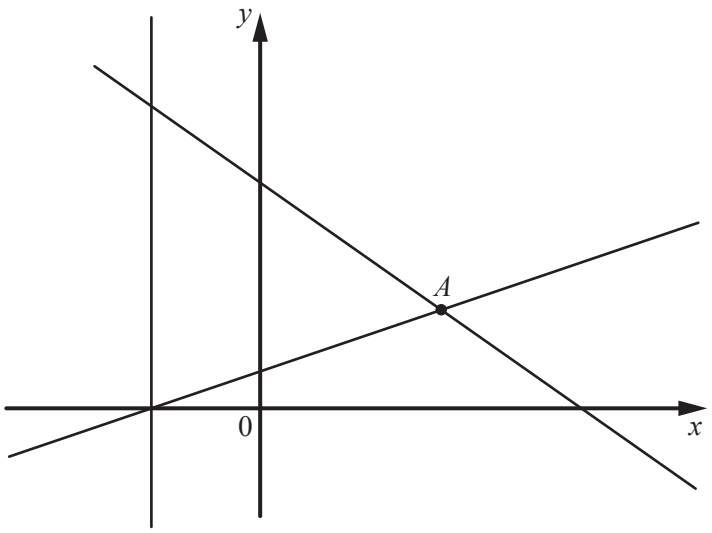
Answer(b)(i) ..... [1]

(ii) There are 3000 students at the college.

Use George's results to estimate the number of students who cycle to college.

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

7



NOT TO SCALE

The diagram shows the lines $x = -2$, $y = \frac{1}{2}x + 1$ and $3x + 4y = 20$.

(a) Use simultaneous equations to find the co-ordinates of the point A.

Answer(a) (....., ...) [3]

(b) (i) P is a point in the region such that

$$x < -2, \quad y > \tfrac{1}{2}x + 1 \quad \text{and} \quad 3x + 4y < 20.$$

On the diagram, mark and label a possible position of P. [1]

(ii) Q is a point in the region such that

$$x > -2, \quad y = \tfrac{1}{2}x + 1 \quad \text{and} \quad 3x + 4y < 20.$$

On the diagram, mark and label a possible position of Q. [1]

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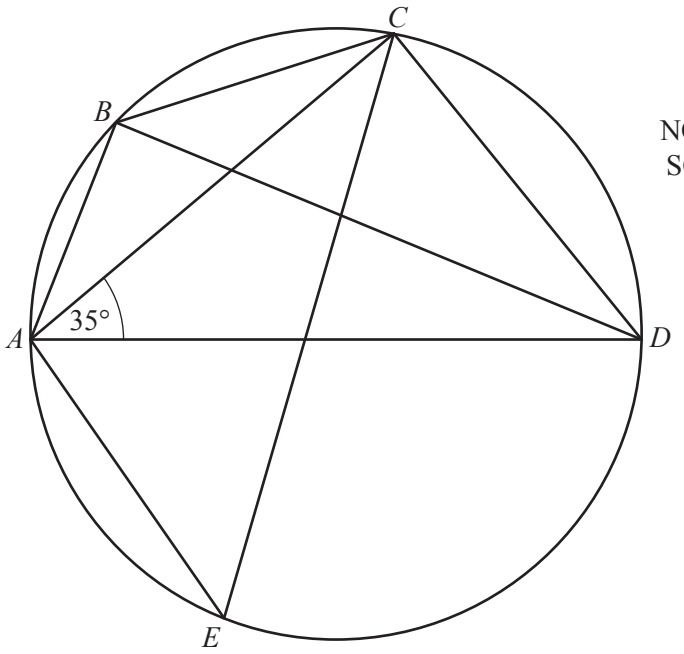


In the diagram, A, B, C, D and E are points on the circle.
AD is a diameter and angle $CAD = 35°$.

Find

(a) angle ACD,

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

(b) angle CBD,

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

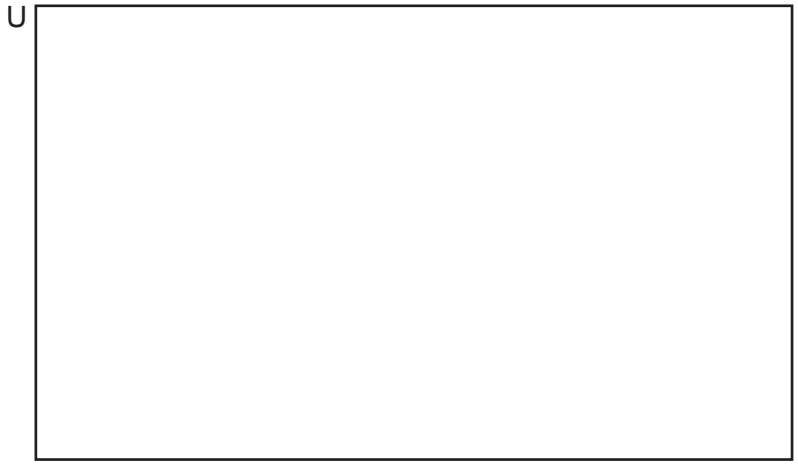
(c) angle AEC.

Answer(c) ..... [2]

9 The sets P, Q and R are subsets of the universal set U.

- $P \cap R \neq \varnothing$
- Q is a subset of R
- $Q \cap P = \varnothing$

Complete the Venn diagram to show the sets P, Q, and R.



[3]

10 **(a)** Factorise $x^2 - 3x - 10$.

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

(b) Make x the subject of $y = \frac{\sqrt[3]{x}}{a}$.

Answer(b) $x =$ ..... [2]

11 **(a)** Find $\log_5 \frac{1}{25}$.

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

(b) Find x when

(i) $\log x - \log 2 = \log 6$,

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

(ii) $\log_x 4 = \frac{1}{2}$.

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

Question 12 is printed on the next page.

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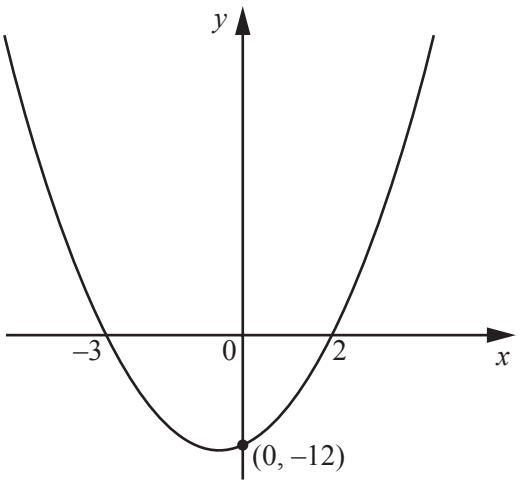

NOT TO SCALE

The diagram shows a sketch of the graph of $y = ax^2 + bx + c$.
The graph goes through the points $(-3, 0)$, $(0, -12)$ and $(2, 0)$.

Find the values a, b and c.

Answer $a =$ .....

$b =$ .....

$c =$ ..... [3]