UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

* 1 0 2 4 0 3 3 7 3 0 *

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/21**

Paper 2 (Extended) **May/June 2013**

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, highlighters, glue or correction fluid.
You may use a 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 **8** printed pages.

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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. $\quad A = \pi rl$

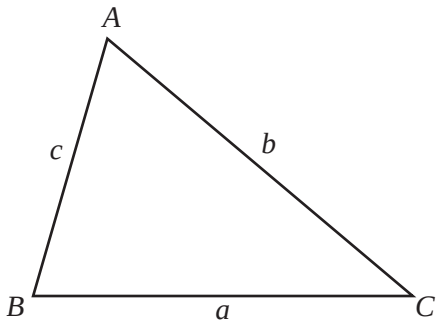
Curved surface area, A, of sphere of radius r. $\quad A = 4\pi r^2$

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. $\quad V = \dfrac{4}{3}\pi r^3$



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

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

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

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Answer **all** the questions.

For Examiner's Use

1 The population of India in 2011 was 1.21×10^9 .
The population of Pakistan in 2011 was 1.77×10^8 .

Calculate the total population of India and Pakistan in 2011.
Give your answer in standard form.

Answer ..... [2]

---

2 P is the point $(-2, 5)$ and Q is the point $(4, 1)$.

(a) Find the co-ordinates of the midpoint of PQ.

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

(b) Find the gradient of PQ.

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

(c) (i) Find the equation of the line perpendicular to PQ which passes through the point $(0, 4)$.

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

(ii) Find the x co-ordinate of the point where this line cuts the x-axis.

Answer(c)(ii) $x =$ ..... [1]

For Examiner's Use

3 Solve these simultaneous equations.

$$y = 2x - 8$$
$$3x + 2y = 5$$

Answer $x =$ .....

Answer $y =$ ..... [3]

---

4 One morning, Ashad carries out a survey on the colours of 200 cars in his town.
These are his results.

Colour	Silver	Black	Red	Blue	Other
Frequency	78	40	36	30	16

(a) Complete this table of relative frequencies.

Colour	Silver	Black	Red	Blue	Other
Relative Frequency		0.2			

[2]

(b) There is a total of 18 000 cars in the town.
Work out an estimate of the number of black cars in the town.

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

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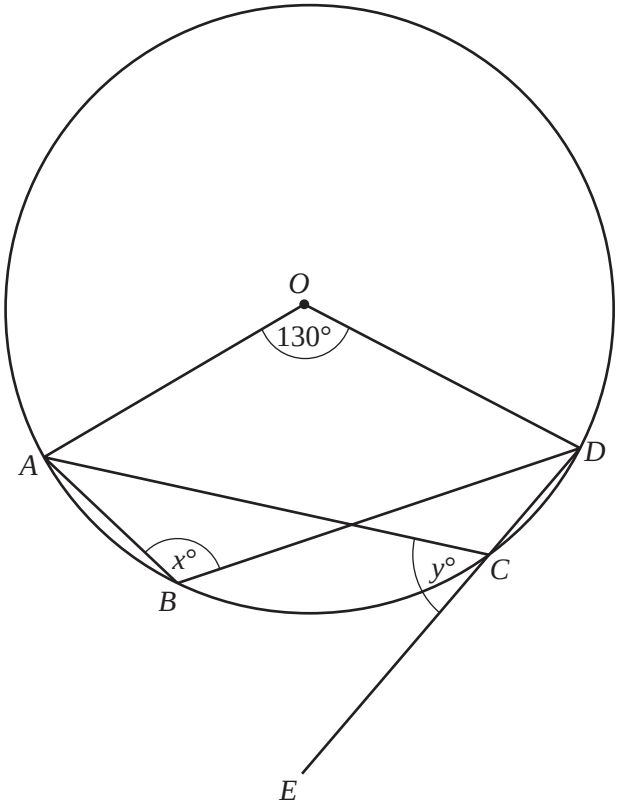


NOT TO SCALE

A, *B*, *C* and *D* are points on the circle centre *O*.
DCE is a straight line.
Angle *AOD* = 130°.

Find the value of

(a) *x*,

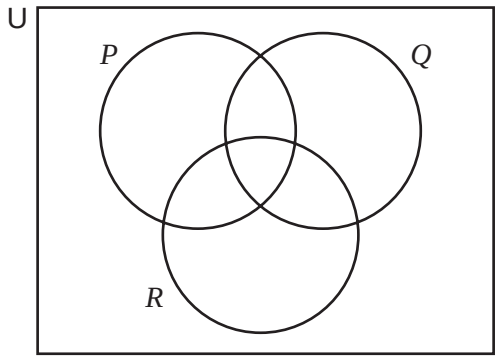
Answer(a) $x =$ ..... [2]

(b) *y*.

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

6

For Examiner's Use



On the Venn diagram write the elements a, b and c in the correct subsets using the following information.

$$a \in (P \cup Q \cup R)'$$

$$b \in P' \cap (Q \cap R)$$

$$c \in (Q \cup R)' \cap P$$

[3]

---

7 **(a)** Write down the value of

(i) log 1000,

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

(ii) log 0.01 .

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

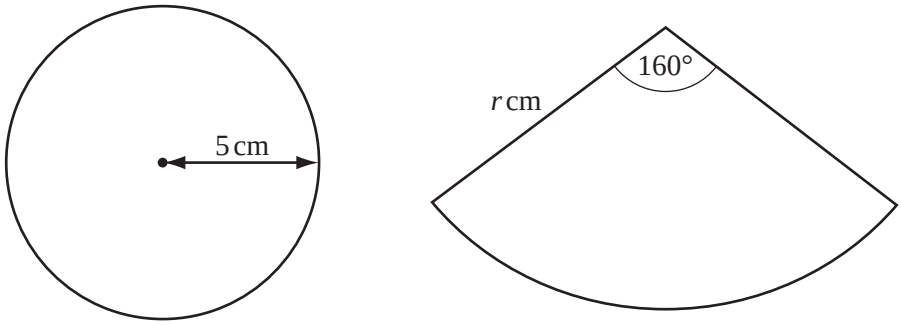
(b) Find p when

$2\log 5 - \log 2 = \log p$.

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

8

For Examiner's Use



The diagrams show a circle with radius 5 cm and the sector of another circle with angle 160° and radius r cm.
The circle and the sector have the same area.

Calculate the value of r.

Answer $r =$ ..... [4]

---

9 Simplify.

(a) $\sqrt{50} + \sqrt{8}$

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

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

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

Questions 10 and 11 are printed on the next page.

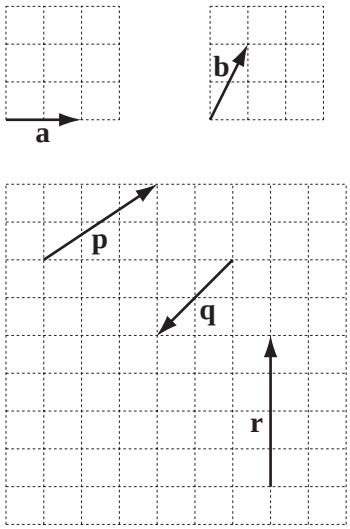
For Examiner's Use

10 Rearrange this equation to make x the subject.

$$ax - 3y = b(x + 2y)$$

Answer $x =$ ..... [3]

11



Write the vectors **p**, **q** and **r** in terms of **a** and **b**.

Answer **p** = ...

q = ...

r = ... [3]

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