Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/23**

Paper 2 (Extended) **October/November 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 **8** printed pages.

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. $\quad A = \pi rl$

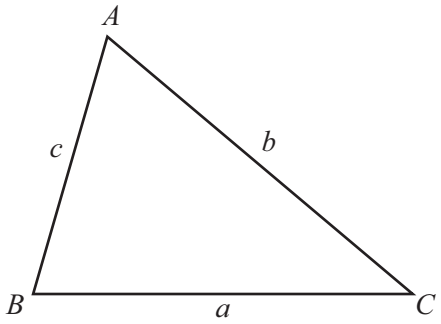
Curved surface area, A, of sphere of radius r. $\quad A = 4\pi r^2$

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 Here are the first five terms of a sequence.

3 7 11 15 19

(a) Write down the next term.

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

(b) Find the nth term of the sequence.

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

---

2 Solve these equations.

(a) $\frac{x}{5} + 7 = 3$

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

(b) $7(x + 3) - 2(x + 4) = 10$

Answer(b) $x =$ ..... [3]

---

3 **Estimate** the value of this calculation.

$$\frac{8.89 \times 61.3}{8.3 + 11.86}$$

Show clearly the values you use.

Answer ..... [3]

---

4 **(a)** Simplify $25^{-\frac{3}{2}}$, giving your answer as a fraction.

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

(b) Simplify.

(i) $(x^3)^4$

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

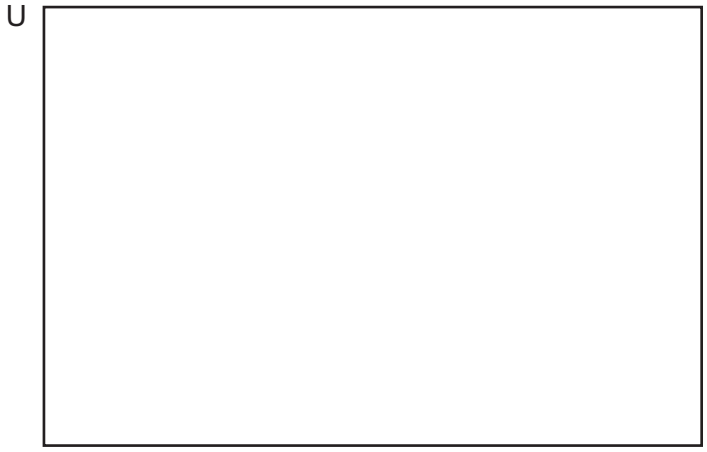
(ii) $\sqrt{\frac{x^{10}}{x^4}}$

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

---

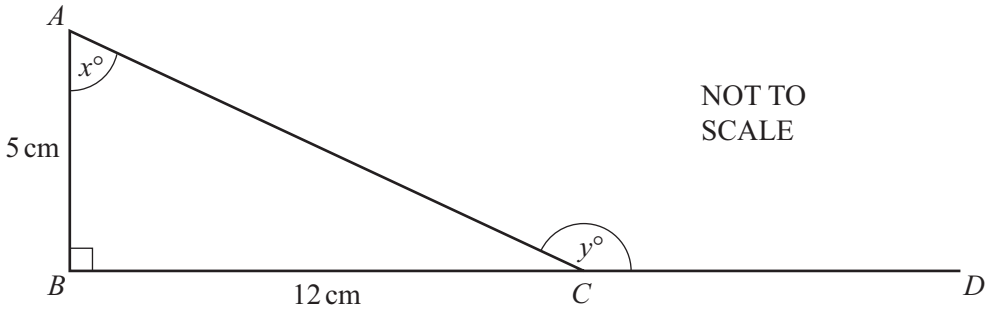
5 In the Venn diagram, show the sets A, B and C so that

$$A \cup B = A, \ B \cap C = \varnothing \text{ and } A \cap C \neq \varnothing.$$



[3]

6



$AB = 5$ cm, $BC = 12$ cm and angle $ABC = 90°$.
BCD is a straight line.

Find

(a) $\tan x°$,

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

(b) $\cos y°$.

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

---

7 Factorise completely.

(a) $3x^2 - 75y^2$

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

(b) $15ap + 10bp - 9a - 6b$

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

---

8 $\mathbf{i} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$ $\mathbf{j} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$ $\mathbf{a} = \begin{pmatrix} 4 \\ -6 \end{pmatrix}$

(a) $\mathbf{a} = p\mathbf{i} + q\mathbf{j}$

Find the values of p and q.

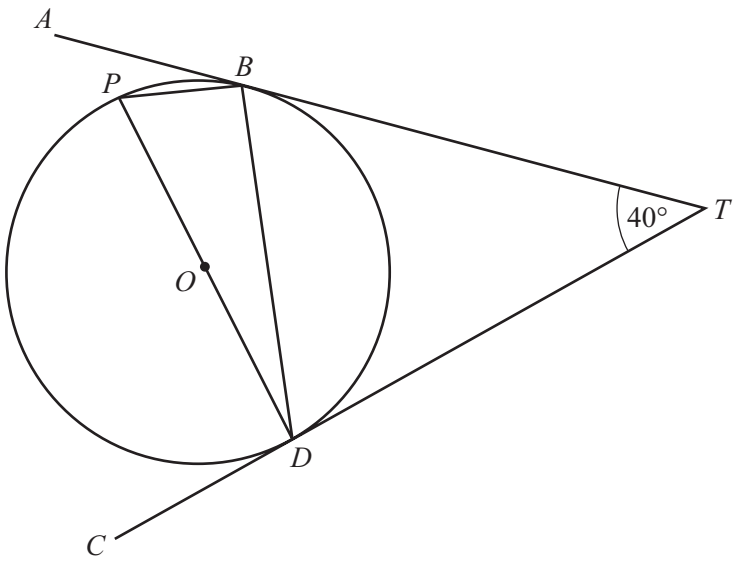
Answer(a) $p =$ .....

$q =$ ..... [2]

(b) Calculate $|\mathbf{a}|$, giving your answer in the form $m\sqrt{n}$ where m and n are prime numbers.

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

9



NOT TO SCALE

B, *D* and *P* are points on the circumference of a circle, centre *O*.
TBA and *TDC* are tangents to the circle.
DP is a diameter and angle *BTD* = 40°.

Find the size of angle *ABP*.

Answer ..... [2]

Question 10 is printed on the next page.

10 $f(x) = 2x + 3$ $g(x) = 5 - 3x$

(a) Find $g(x)$ when $f(x) = 11$.

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

(b) Find and simplify an expression for $f(g(x))$.

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

(c) Find $g^{-1}(x)$.

Answer(c) $g^{-1}(x) =$ ..... [2]