UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

4727863751

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/22**

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.

UNIVERSITY of 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. $\quad A = \pi rl$

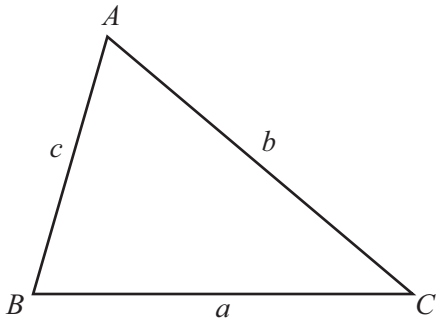
Curved surface area, A, of sphere of radius r. $\quad A = 4\pi r^2$

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



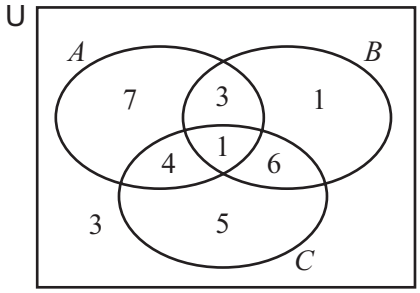
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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

Answer **all** the questions.

1



The Venn diagram shows the **number of elements** in each of the sets A, B and C, and $n(U) = 30$.

(a) Find

(i) n(A),

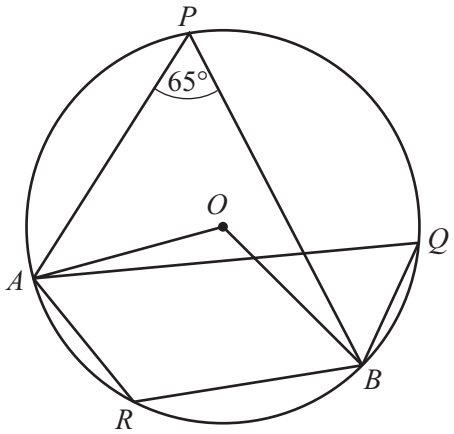
Answer(a)(i) ..... [1]

(ii) $n(C \cup B')$.

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

(b) Shade the region $(A \cap B) \cup C$ on the Venn diagram. [1]

2



NOT TO SCALE

A, P, Q, B and R lie on a circle, centre O.
Angle $APB = 65°$.

Find

(a) angle AQB,

Answer(a) Angle AQB = ... [1]

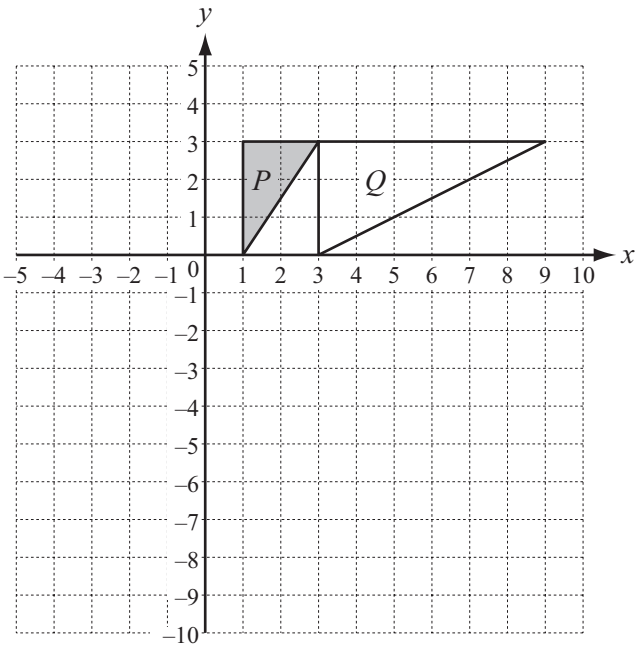
(b) angle AOB,

Answer(b) Angle AOB = ... [1]

(c) angle ARB.

Answer(c) Angle ARB = ... [1]

3



(a) Enlarge shape P using centre (3, 4) and scale factor 3. [2]

(b) Describe fully the **single** transformation that maps shape P onto shape Q.

.....

..... [3]

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4 **(a)** Simplify.

$16x^{16} \div 2x^2$

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

(b) $8^n = \frac{1}{2}$

Find the value of n.

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

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5 Rationalise the denominator in each of the following.

(a) $\frac{2}{\sqrt{3}}$

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

(b) $\frac{1}{\sqrt{3}-1}$

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

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6 **(a)** Find the value of ax^3 when $a = 1200$ and $x = 5$.
Give your answer in standard form.

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

(b) Make x the subject of the formula $y = ax^3$.

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

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7 **(a)** Write $2\log(x + 1) - \log(x - 1)$ as a single logarithm.

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

(b) $\log_3 p = 4$ where p is an integer.

Find the value of p.

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

---

8 These are the first five terms of a sequence.

2 6 12 20 30

(a) Find the next term.

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

(b) Find an expression for the nth term.

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

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9 $f(x) = 3 + 2x$

Find

(a) $f(f(-4))$,

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

(b) $f^{-1}(x)$.

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

---

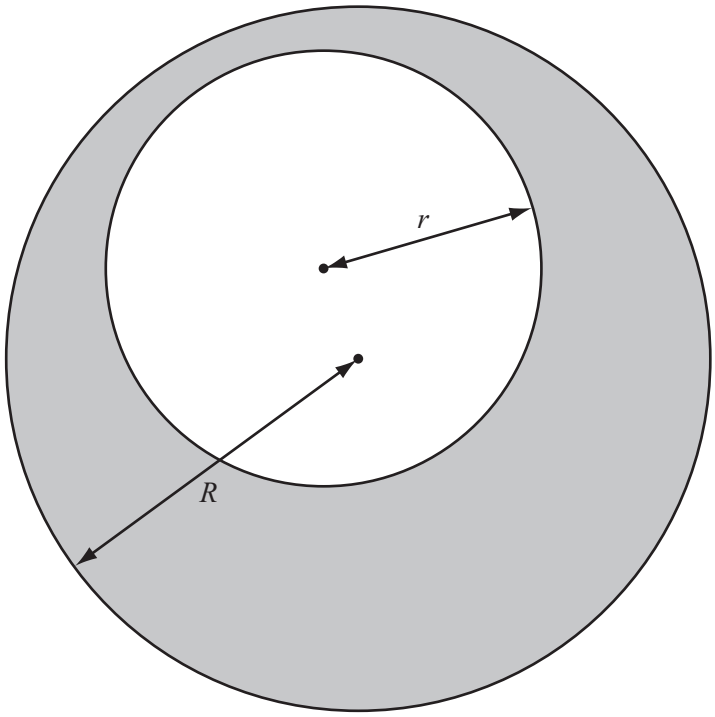
10 y varies inversely as x^2.
When $x = 2$, $y = 24$.

Find a formula for y in terms of x.

Answer $y =$ ..... [2]

Question 11 is printed on the next page.

11



NOT TO SCALE

The diagram shows a circle of radius r inside a circle of radius R.

(a) Find an expression, in terms of π, r and R, for the shaded area.
Factorise your expression completely.

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

(b) When $R = r + 3$, the shaded area is 24π.

Find the value of r.

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