Cambridge Assessment International Education

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CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/21**

Paper 2 (Extended) **May/June 2022**

45 minutes

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- Calculators must **not** be used in this paper.
- You may use tracing paper.
- You must show all necessary working clearly and you will be given marks for correct methods even if your answer is incorrect.
- All answers should be given in their simplest form.

INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **8** 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. $\quad A = \pi rl$

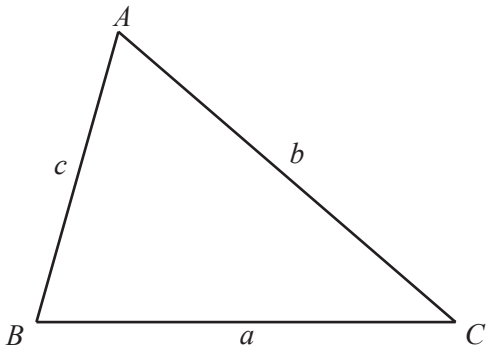
Curved surface area, A, of sphere of radius r. $\quad A = 4\pi r^2$

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

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



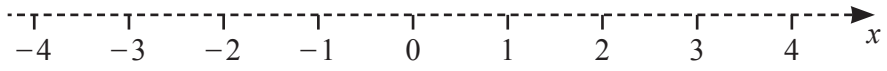
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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

Answer **all** the questions.

1 On the number line, show the inequality $-2 \leqslant x < 3$.



[2]

2 Work out $4 \times \begin{pmatrix} 6 \\ -2 \end{pmatrix}$.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

3 21 24 25 27 29 39 48

From the list of numbers, write down

(a) the prime number,

..... [1]

(b) the cube number.

..... [1]

4 Factorise $x^3 - 2x$.

..... [1]

5 **(a)** Write 7.297 84 correct to 3 significant figures.

..... [1]

(b) Write 0.000 003 06 in standard form.

..... [1]

6 Solve.

(a) $4x = 28$

$x =$ ..... [1]

(b) $3(a - 6) = 24$

$a =$ ..... [2]

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[Turn over

7 Karen has 3 blue hats, 5 red hats and 2 white hats.
She also has 4 blue scarves, 3 red scarves and 1 white scarf.

(a) Karen takes a hat at random and replaces it.

Find the probability that it is white.

..... [1]

(b) Karen takes a hat and a scarf at random.

Find the probability that both the hat and the scarf are blue.

..... [2]

8 Find the value of $49^{\frac{1}{2}}$.

..... [1]

9 Write 90 as the product of its prime factors.

..... [2]

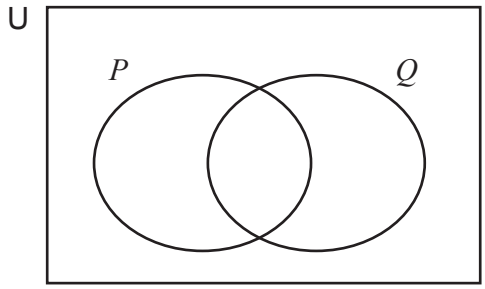
10 Find the magnitude of the vector $\begin{pmatrix} 2 \\ 6 \end{pmatrix}$.

Give your answer in simplest surd form.

..... [2]

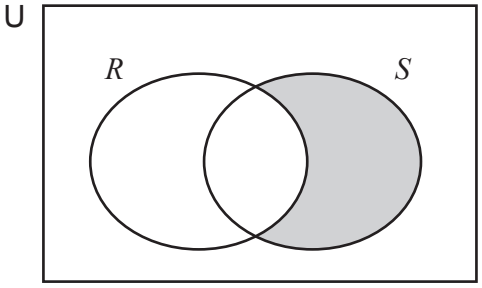
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11 **(a)** Shade $P \cup Q$.



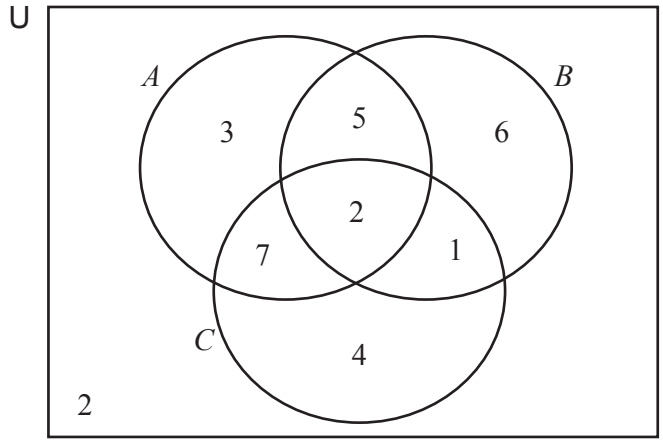
[1]

(b) Describe the shaded area using set notation.



..... [1]

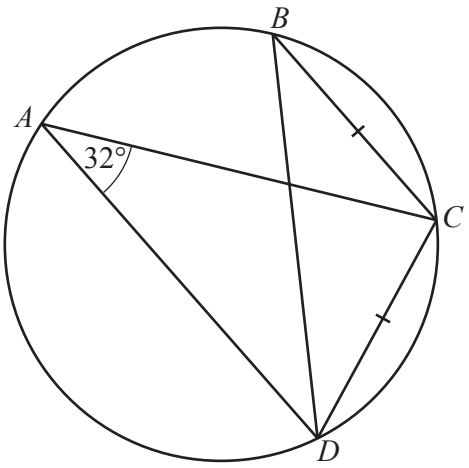
(c) The Venn diagram shows the number of elements in each subset.



Find $\mathrm{n}((B' \cap C) \cap A)$.

..... [1]

12 (a)



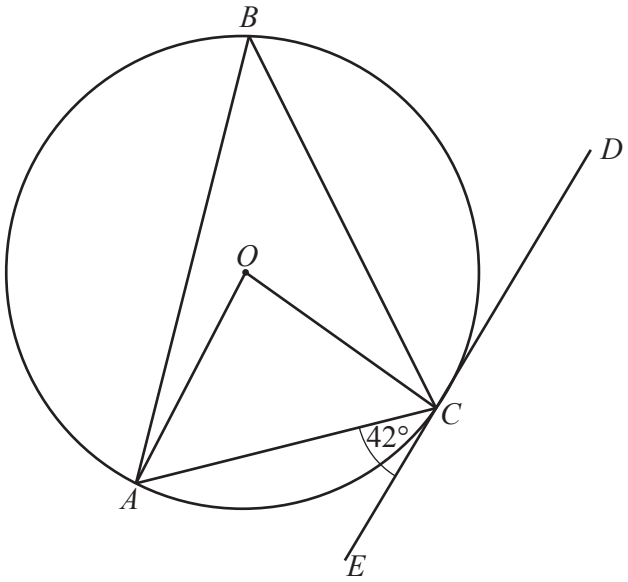
NOT TO SCALE

A, B, C, and D are points on a circle.
Angle $DAC = 32°$.
$BC = DC$.

Find angle BCD.

Angle $BCD =$ ..... [2]

(b)



NOT TO SCALE

A, B and C are points on the circle centre O.
ECD is a tangent to the circle at C.
Angle $ACE = 42°$.

Find angle AOC.

Angle $AOC =$ ..... [2]

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13 **(a)** Simplify fully.

$$\sqrt{75} - \sqrt{48} + \sqrt{12}$$

..... [2]

(b) Rationalise the denominator, giving your answer in its simplest form.

$$\frac{1}{\sqrt{3}+5}$$

..... [2]

14 $x^2 - 14x + c = (x+d)^2$

Find the value of c and the value of d.

$c =$ .....

$d =$ ..... [3]

Questions 15 and 16 are printed on the next page.

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15 **(a)** Factorise fully.

$$6x^2 - 7x - 3$$

..... [2]

(b) Solve.

$$6x^2 - 7x - 3 < 0$$

..... [3]

16 Solve.

$$2\log 3 - \log 2 = \log p$$

$p =$ ..... [2]

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