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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.

Formula List

For the equation $ax^2 + bx + c = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Curved surface area, A , of cylinder of radius r , height h . $A = 2\pi rh$

Curved surface area, A , of cone of radius r , sloping edge l . $A = \pi rl$

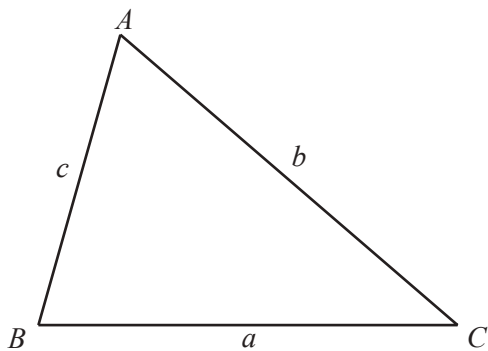
Curved surface area, A , of sphere of radius r . $A = 4\pi r^2$

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

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

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

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



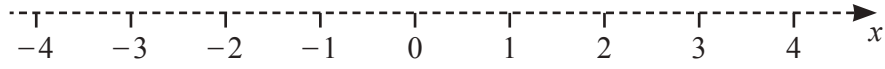
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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

Answer **all** the questions.

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



[2]

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

$\begin{pmatrix} \\ \end{pmatrix}$ [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 7.29784 correct to 3 significant figures.

..... [1]

- (b) Write 0.00000306 in standard form.

..... [1]

- 6 Solve.

- (a) $4x = 28$

$x =$ [1]

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

$a =$ [2]

- 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.

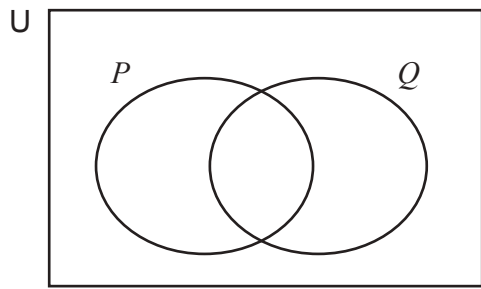
..... [2]

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

Give your answer in simplest surd form.

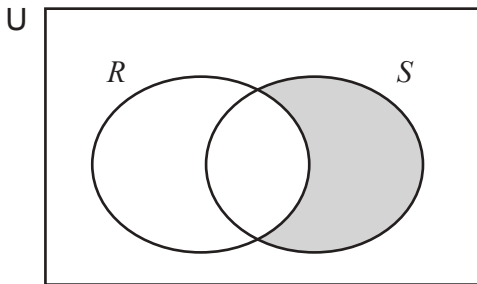
..... [2]

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



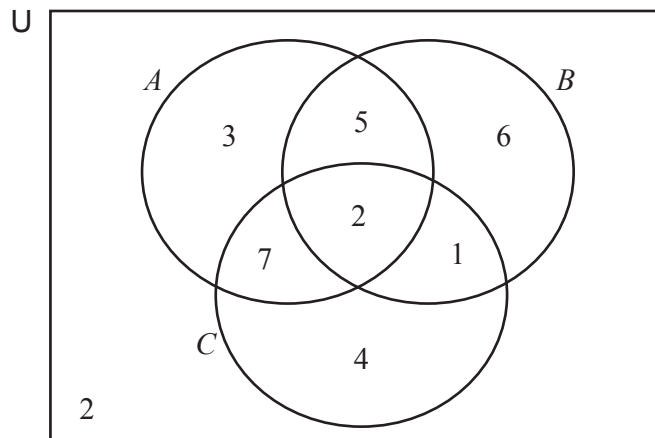
[1]

(b) Describe the shaded area using set notation.



..... [1]

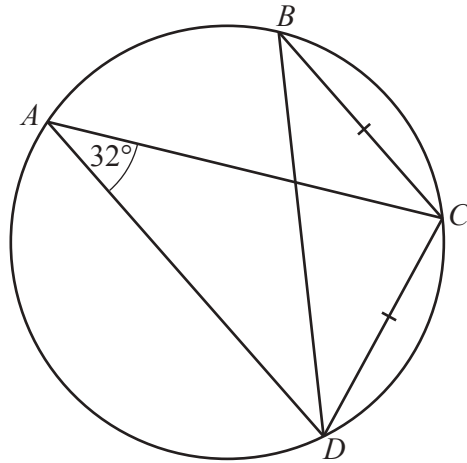
(c) The Venn diagram shows the number of elements in each subset.



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

..... [1]

12 (a)



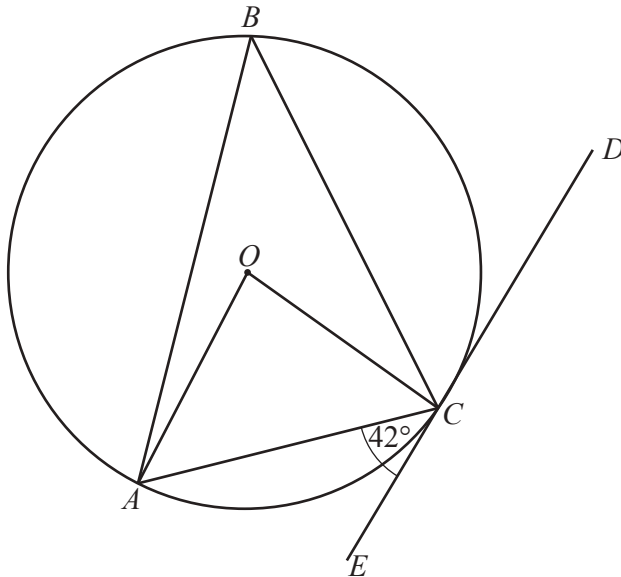
NOT TO SCALE

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

Find angle BCD .

Angle $BCD = \dots\dots\dots$ [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 $ACE = 42^\circ$.

Find angle AOC .

Angle $AOC = \dots\dots\dots$ [2]

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.

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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