

CANDIDATE
NAME

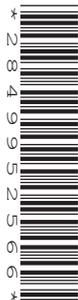
--

CENTRE
NUMBER

--	--	--	--	--

CANDIDATE
NUMBER

--	--	--	--



MATHEMATICS

0626/04

Paper 4 (Extended)

October/November 2018

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Geometrical instruments
 Tracing paper (optional)

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.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

CALCULATORS MAY NOT BE USED IN THIS PAPER.

If working is required for any question it must be shown below that question.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total of the marks for this paper is 84.

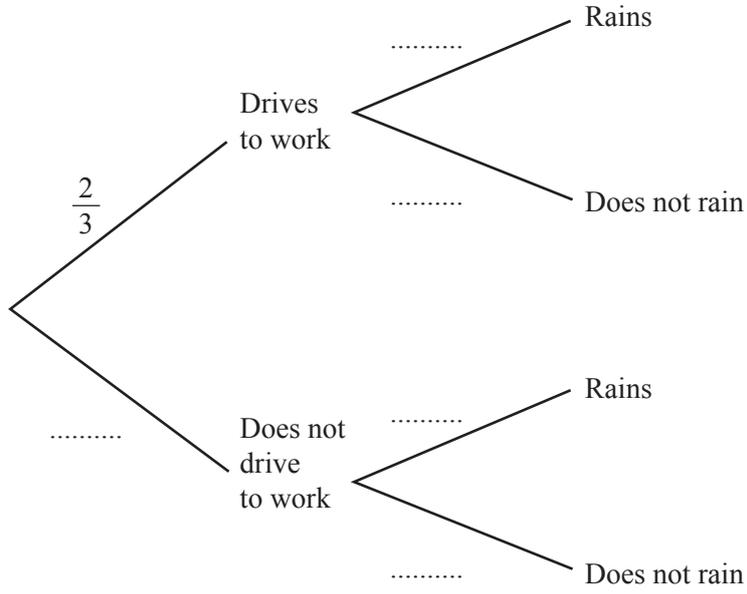
This syllabus is regulated for use in England as a Cambridge International Level 1/Level 2 (9–1) Certificate.

This document consists of **16** printed pages.

1 The probability that Marc drives to work on any day is $\frac{2}{3}$.

The probability that it rains on any day is $\frac{1}{5}$.

(a) Complete the tree diagram.



[2]

(b) Work out the probability that one day Marc drives to work and it does not rain.

..... [2]

2 Expand and simplify.

$$4(2r + 3) + 3(1 - 5r)$$

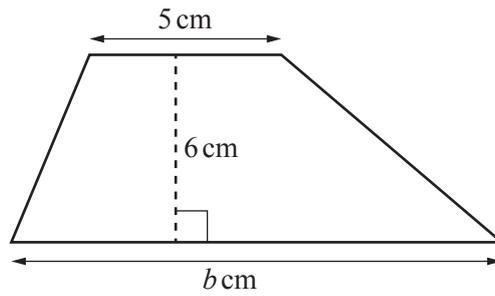
..... [2]

3 By rounding each number correct to 1 significant figure, estimate the value of

$$\frac{43.01 + 9.94}{32.644 - 4.777}$$

..... [2]

4

NOT TO
SCALE

The area of this trapezium is 39 cm^2 .

Find the value of b .

$$b = \dots\dots\dots [3]$$

5 The width, $w \text{ cm}$, of an oven is 60 cm correct to the nearest centimetre.

(a) Complete this statement about the value of w .

$$\dots\dots\dots \leq w < \dots\dots\dots [2]$$

(b) There is a gap between two cupboards in a kitchen.
The width of the gap is 90 cm , correct to the nearest centimetre.
The oven is placed in the gap.

Work out the upper bound of the width of the remaining space.

$$\dots\dots\dots \text{ cm} [2]$$

6 Work out $(\sqrt[3]{64})^2$.

..... [2]

7 The interior angle of a regular polygon is 150° .

Show that the polygon has 12 sides.

[2]

8 (a) Solve $5(7-x) = 55$.

$x = \dots\dots\dots$ [3]

(b) Rearrange the formula $L = \sqrt{\pi r}$ to make r the subject.

$r = \dots\dots\dots$ [2]

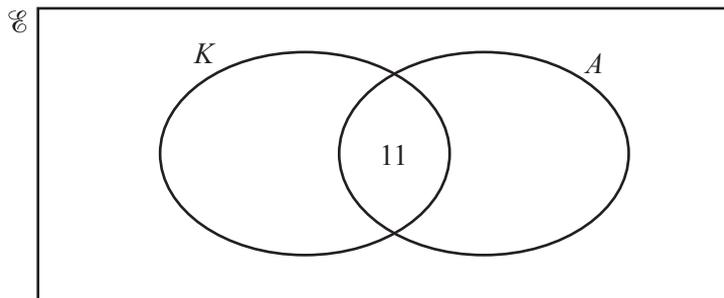
9 A travel company asked 60 people where they went on holiday last year.

- 30 people went on holiday in the UK
- 11 people went on holiday both in the UK and abroad
- 6 people did not go on holiday

$K = \{\text{people who went on holiday in the UK}\}$

$A = \{\text{people who went on holiday abroad}\}$

(a) Complete the Venn diagram to show this information.



[2]

(b) Find $n(A \cup K)$.

$\dots\dots\dots$ [1]

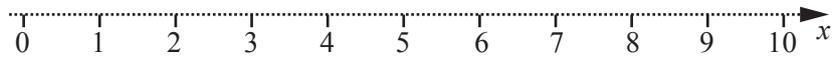
10 Work out the magnitude of the vector $\begin{pmatrix} 6 \\ -8 \end{pmatrix}$.

..... [2]

11 (a) (i) Solve the inequality $4x + 12 < 40$.

..... [2]

(ii) Show your solution to **part (a)(i)** on this number line.



[1]

(b) Write down all the **integers** that satisfy this inequality.

$$-2 < x \leq 3$$

..... [2]

12 Simplify $(25x^{10})^{\frac{3}{2}}$.

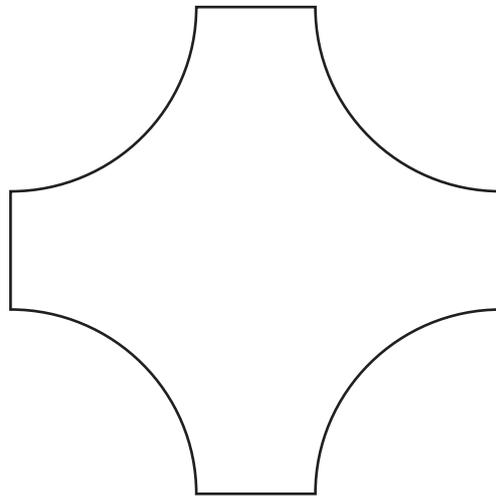
..... [2]

- 13 The surface area of a cube is 54 cm^2 .

Find the volume of this cube.

..... cm^3 [3]

- 14



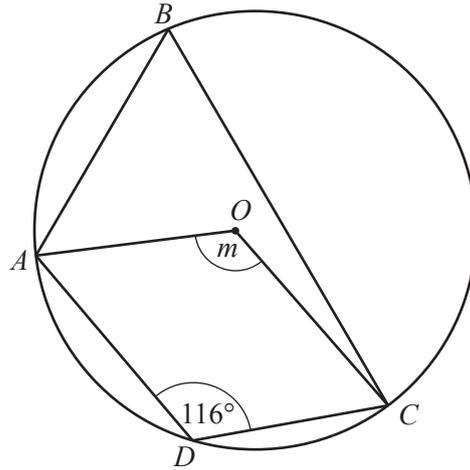
NOT TO
SCALE

This shape is made from four straight edges and four arcs.
Each straight edge has length 3 cm.
Each arc is a quarter of the circumference of a circle of radius 5 cm.

Find the perimeter of this shape.
Give your answer in terms of π .

..... cm [3]

15

NOT TO
SCALE

A , B , C and D are points on a circle, centre O .

Show that angle $m = 128^\circ$.

Give a reason for each step of your working.

[3]

16 You are given that w is a 2-digit number and that $\sqrt{2} \times \sqrt{w}$ is an integer that is less than 10.

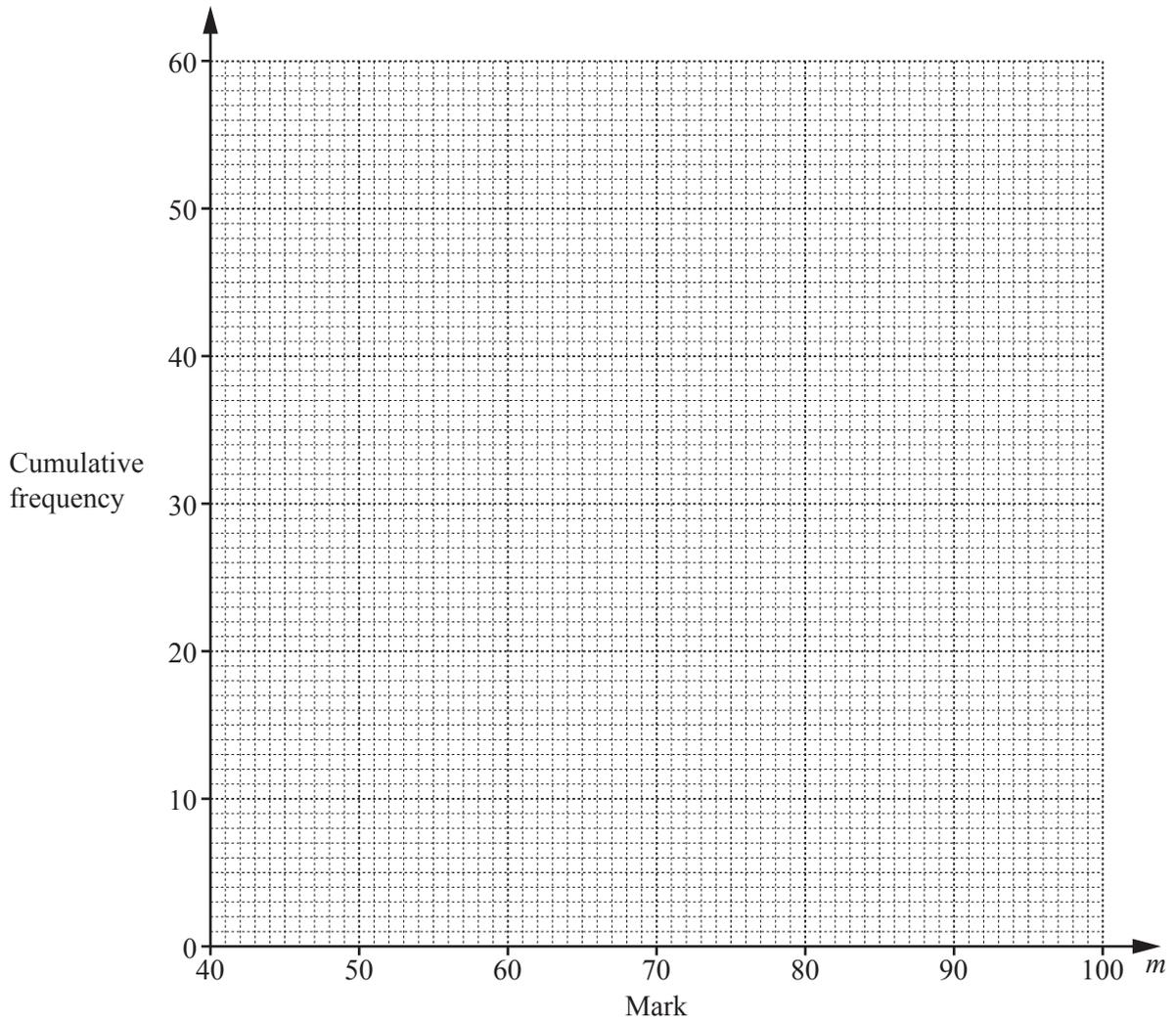
Find the two possible values of w .

$w = \dots\dots\dots$ or $w = \dots\dots\dots$ [3]

17 This table shows the distribution of marks in a literacy test taken by 60 students.

Mark (m)	Frequency
$40 < m \leq 50$	8
$50 < m \leq 60$	12
$60 < m \leq 70$	14
$70 < m \leq 80$	12
$80 < m \leq 90$	9
$90 < m \leq 100$	5

(a) Draw a cumulative frequency diagram to represent this information.

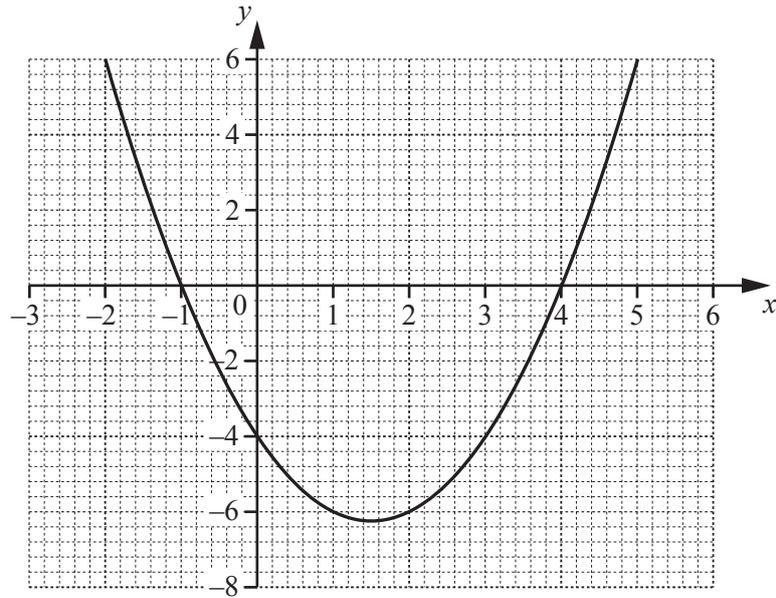


[4]

(b) Three-quarters of the students pass the test.

Use your diagram to find an estimate for the pass mark of the test.

..... [2]



The graph of $y = x^2 - 3x - 4$ is shown on the grid.

By drawing a suitable straight line on the grid, solve the equation $x^2 - x - 5 = 0$.

..... [3]

19 (a) $f(x) = 5x - 3$

Find and simplify an expression for $ff(x)$.

..... [2]

(b) A function $g(x)$ is defined as self-inverse if $g(x) = g^{-1}(x)$.

$$h(x) = 2 - x$$

Show that $h(x)$ is self-inverse.

[2]

20 Express $x^2 - 8x - 7$ in the form $(x + p)^2 + q$ where p and q are integers.

..... [2]

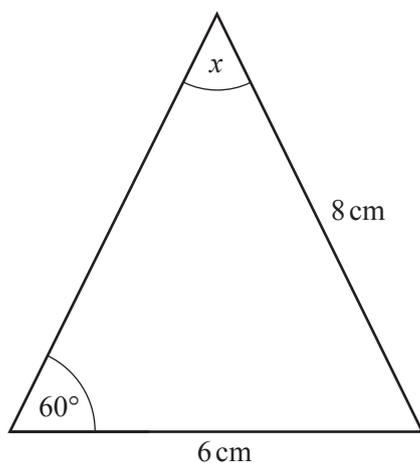
- 21 Given that $\frac{x-2}{x-3} + \frac{x}{4} = 3$, show that $x^2 - 11x + 28 = 0$.

[3]

- 22 (a) Write down the exact value of $\sin 60^\circ$.

..... [1]

(b)

NOT TO
SCALEFind the exact value of $\sin x$.Write your answer in the form $\frac{a\sqrt{3}}{b}$ where a and b are integers.

..... [3]

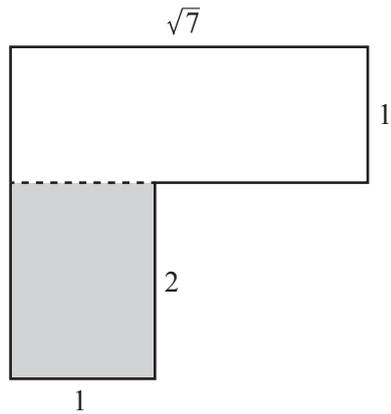
23 (a) Given that $y = 2x^3 + 3x^2 - 12x$, find $\frac{dy}{dx}$.

$$\frac{dy}{dx} = \dots\dots\dots [2]$$

(b) Find the co-ordinates of the two turning points of the curve $y = 2x^3 + 3x^2 - 12x$.

(.....,) and (.....,) [4]

24 In this question all lengths are in centimetres.



NOT TO
SCALE

This shape is made from two rectangles.

Show that the fraction of the whole shape that is shaded is $\frac{2\sqrt{7}-4}{3}$.

[5]

Question 25 is printed on the next page.

25 Solve $\sqrt{2}\cos x - 1 = 0$ for $0^\circ \leq x \leq 360^\circ$.

..... [3]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.