Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education (9–1)

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

0015591201

MATHEMATICS **0626/02**

Paper 2 (Extended) **October/November 2019**

1 hour

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 and graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
Electronic calculators should be used.
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.
For π, use either your calculator value or 3.142.

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 60.

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

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1 Solve.

$$\frac{16+x}{7} = 3$$

$x =$ ..... [2]

2 Change $5\,m^3$ into cm^3.

..... cm^3 [1]

3 Find the highest common factor (HCF) of 315 and 225.

..... [2]

4 A bus travels at a constant speed of 90 kilometres per hour.

Calculate the distance the bus travels in 22 seconds.

..... km [3]

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5 Adele and Pierre both walked their family dog on 1 January.
After that, Adele walks the dog every 8th day and Pierre walks the dog every 12th day.

After 1 January, how many times do Adele and Pierre both walk the dog on the same day during this year (365 days)?

..... [3]

6 **(a)** Here are the first four terms of a sequence.

2 9 16 23

Find the nth term of this sequence.

..... [2]

(b) Here are the first four terms of a different sequence.

1 8 27 64

(i) Find the next term of this sequence.

..... [1]

(ii) 42 875 is a term in this sequence.

Work out the term number of 42 875.

..... [1]

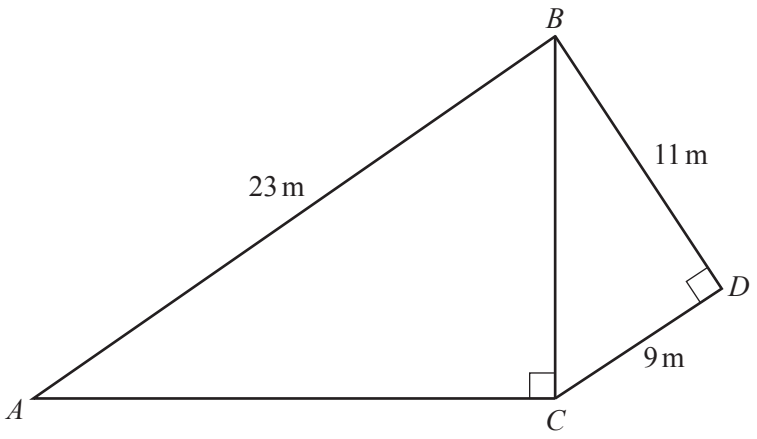
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7 Simplify.

$$\frac{8x^7y^6}{4x^2}$$

..... [2]

8 The diagram shows two right-angled triangles, *ABC* and *BCD*.

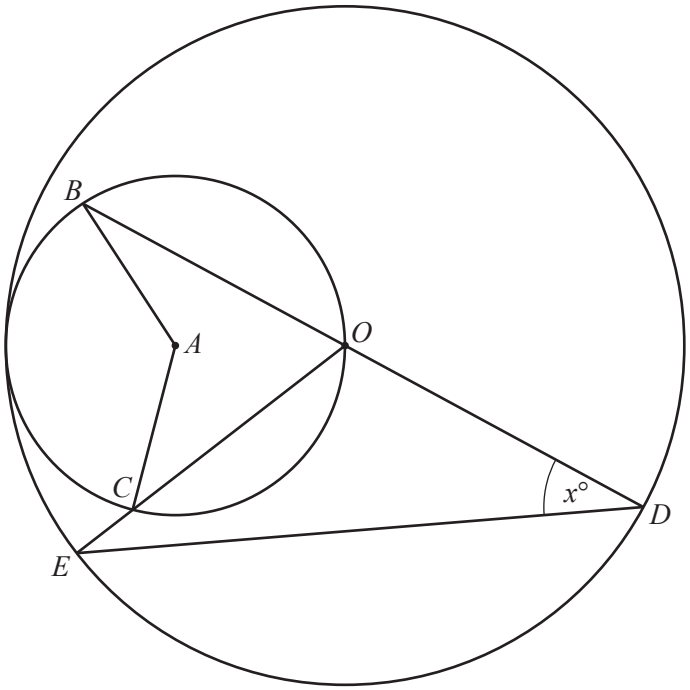


NOT TO SCALE

Show that *AC* is 18.1 m correct to 1 decimal place.

[4]

9 The diagram shows two circles.



NOT TO SCALE

Points D and E lie on the large circle, centre O.
Points O, B and C lie on the small circle, centre A.
BOD is a straight line and angle $BDE = x°$.

Find, in terms of x, an expression for

(a) angle BOC,

Angle BOC = ... [1]

(b) reflex angle BAC.

Reflex angle BAC = ... [2]

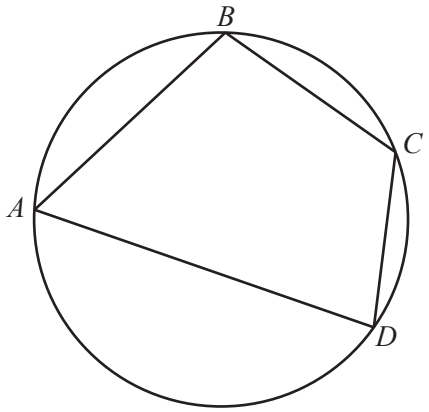
10 The area of a rectangular garden is 1677 m^2 correct to the nearest m^2.
The length of the garden is 68.4 m correct to 3 significant figures.

Calculate the upper bound for the width of the garden.
Give your answer correct to 4 significant figures.

..... m [3]

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NOT TO SCALE

ABCD is a cyclic quadrilateral.
Its angles are in the ratio

$$\text{angle } A : \text{angle } B : \text{angle } C : \text{angle } D = 3 : 6 : 7 : x.$$

Work out the size of angle *D*.
State any geometrical reason you use.

Angle $D =$ ..... [4]

12 Cassie and Ben each have a fair 6-sided dice.
They both throw their dice at the same time.

(a) Cassie says:

The probability that the score on my dice is less than the score on Ben's dice is $\frac{5}{12}$.

Show that Cassie is correct.

[2]

(b) Cassie and Ben both throw their dice 60 times.

Work out the expected number of times that Cassie's score is less than Ben's score.

..... [1]

(c) Cassie and Ben each have 150 counters.

If the score on Cassie's dice is less than the score on Ben's dice, Cassie gives Ben 3 counters.
Otherwise, Ben gives Cassie 4 counters.

Work out the expected number of counters they will each have after they have both thrown their dice 60 times.

Cassie .....counters

Ben .....counters [3]

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13
$$\begin{pmatrix} 3 & -2 \\ -4 & 1 \end{pmatrix}\begin{pmatrix} 4 & -3 \\ a & 5 \end{pmatrix} = \begin{pmatrix} b & -19 \\ -18 & 17 \end{pmatrix}$$

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [3]

14 **(a)** Express $x^2 - 6x + 4$ in the form $(x + a)^2 + b$.

..... [3]

(b) Write down the co-ordinates of the minimum point on the graph of $y = x^2 - 6x + 4$.

(..... , ...) [2]

15 **(a)** Solve the simultaneous equations.
You must show your working.

$$x^2 + y^2 = 20$$
$$y = 2x + 10$$

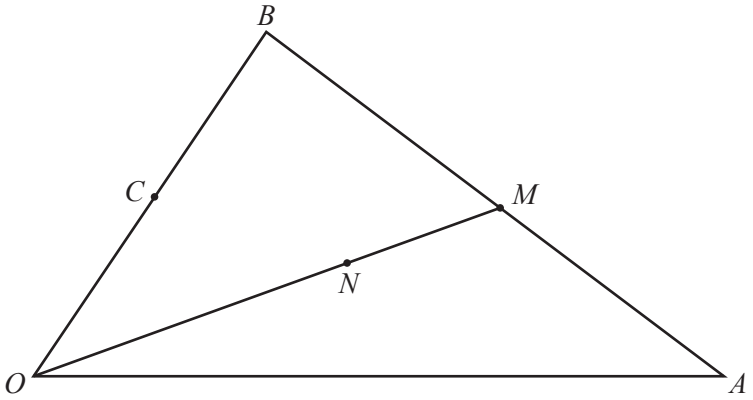
..... [5]

(b) Explain what your answer to **part (a)** tells you about the graphs of $x^2 + y^2 = 20$ and $y = 2x + 10$.

.....

..... [1]

16



NOT TO SCALE

$\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.
M is the midpoint of AB.
C is the midpoint of OB.
$\overrightarrow{ON} = \frac{3}{4}\overrightarrow{OM}$.

(a) Write the following vectors in terms of **a** and **b**.
Give your answers in their simplest form.

(i) $\overrightarrow{AC}$

$\overrightarrow{AC} =$ ..... [1]

(ii) $\overrightarrow{OM}$

$\overrightarrow{OM} =$ ..... [2]

(iii) $\overrightarrow{AN}$

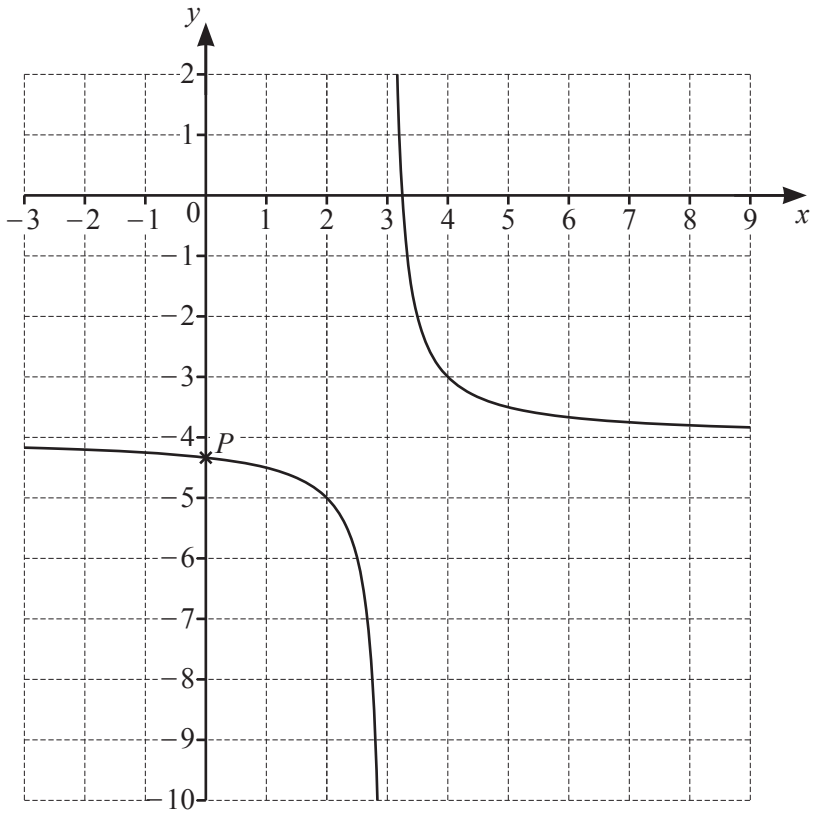
$\overrightarrow{AN} =$ ..... [2]

(b) Do the points A, N and C lie on the same straight line?
Justify your answer using vectors.

..... [1]

Question 17 is printed on the next page.

17



The graph of $y = \frac{1}{x-3} - 4$ is drawn on the grid.

(a) P is the point where the graph intersects the y-axis.

Work out the co-ordinates of P.

(..... , ...) [1]

(b) Write down the equations of the asymptotes of the graph.

..... [2]

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