Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

5676838059

MATHEMATICS **0580/22**

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

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Tracing paper (optional)
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.
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.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
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 70.

DC (LK/CGW) 172538/2

1 The lowest temperature recorded at Scott Base in Antarctica is $-57.0\,°C$.
The highest temperature recorded at Scott Base is $63.8\,°C$ more than this.

What is the highest temperature recorded at Scott Base?

..... °C [1]

2 Calculate.

$$\frac{5}{8} + \sqrt[3]{340}$$

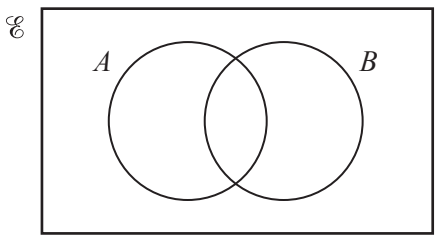
..... [1]

3 Expand.

$$a(a^3 + 3)$$

..... [1]

4 On the Venn diagram, shade the region $(A \cap B)'$.



[1]

5 The mass, correct to the nearest kilogram, of each of 11 parcels is shown below.

24 23 23 26 25 27 18 96 16 17 32

(a) Find the mode.

..... kg [1]

(b) Give a reason why the mean would be an unsuitable average to use.

..... [1]

6 The table shows how children in Ivan's class travel to school.

Travel to school	Number of children
Walk	12
Car	7
Bicycle	9
Bus	4

Ivan wants to draw a pie chart to show this information.

Find the sector angle for children who walk to school.

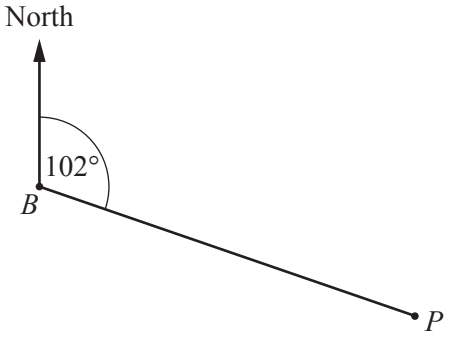
..... [2]

7 Rashid changes 30 000 rupees to dollars when the exchange rate is \$1 = 68.14 rupees.

How many dollars does he receive?

\$ ..... [2]

8



NOT TO SCALE

The bearing of P from B is 102°.

Find the bearing of B from P.

..... [2]

9 Solve the inequality.

$$\frac{x}{2} - 13 > 12 + 3x$$

..... [2]

10 Write the recurring decimal $0.6\dot{7}$ as a fraction.
Show all your working and give your answer in its simplest form.

..... [2]

11 **Without using a calculator**, work out $3\frac{5}{8} - 1\frac{2}{3}$.
You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

12 A regular polygon has an interior angle of 176°.

Find the number of sides of this polygon.

..... [3]

13 Two mathematically similar containers have heights of 30 cm and 75 cm.
The larger container has a capacity of 5.5 litres.

Calculate the capacity of the smaller container.
Give your answer in millilitres.

..... ml [3]

14 Show that the line $4y = 5x - 10$ is perpendicular to the line $5y + 4x = 35$.

[3]

15 Esme buys x magazines at \$2.45 each and y cards at \$3.15 each.

(a) Write down an expression, in terms of x and y, for the total cost, in dollars, of the magazines and the cards.

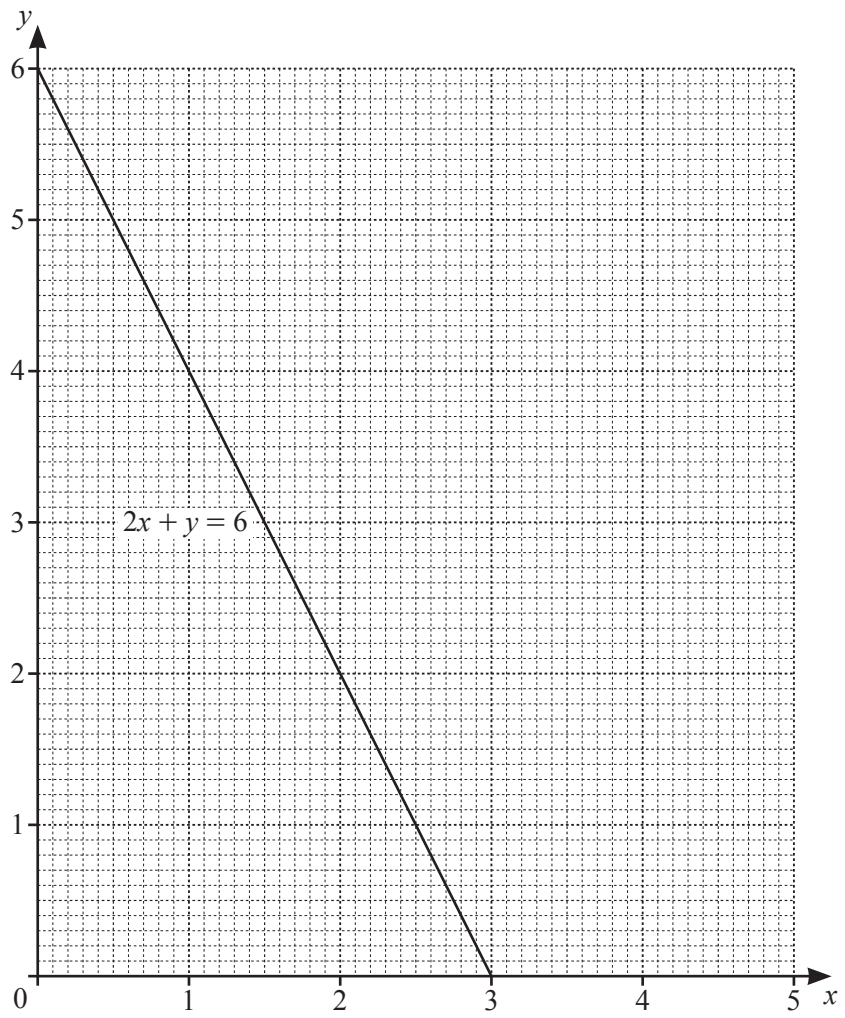
\$ ..... [2]

(b) Esme spends \$60.55 in total.
She buys 8 magazines.

How many cards does she buy?

..... [2]

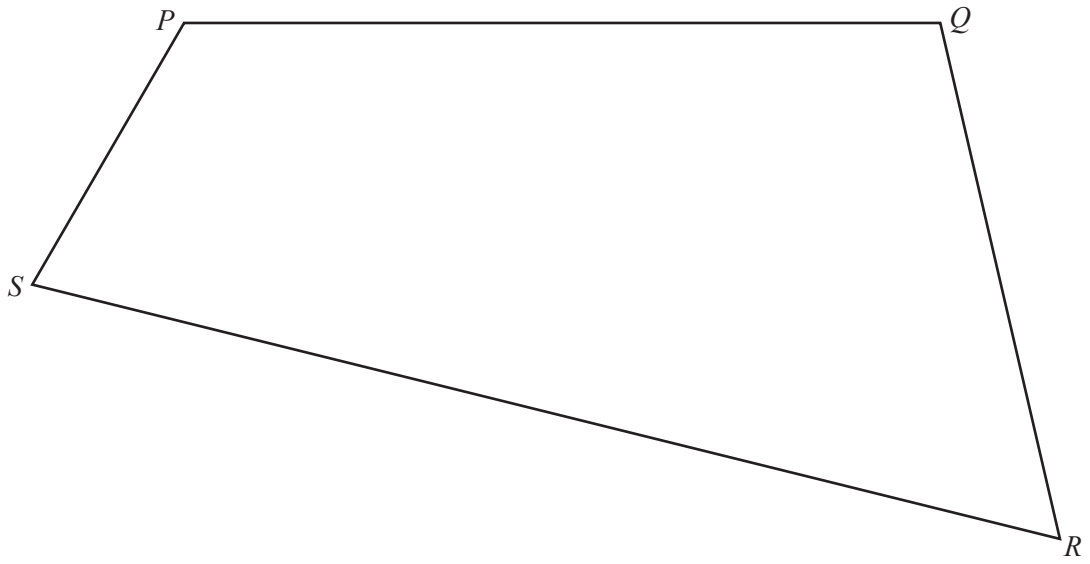
16



By shading the **unwanted** regions of the grid, find and label the region R that satisfies the following inequalities.

$y \leqslant 5$ $\quad 2x + y \geqslant 6$ $\quad y \geqslant x + 1$ [4]

17 The diagram shows a scale drawing of Lei's garden, *PQRS*.
The scale is 1 centimetre represents 2 metres.



Scale: 1 cm to 2 m

Lei has a bird table in the garden that is

- equidistant from *PQ* and *QR*

and

- 13 m from *R*.

On the diagram, construct the position of the bird table.
Use a ruler and compasses only and show all your construction arcs. [4]

18 Harris is taking a driving test.
The probability that he passes the driving test at the first attempt is 0.6 .
If he fails, the probability that he passes at any further attempt is 0.75 .

Calculate the probability that Harris

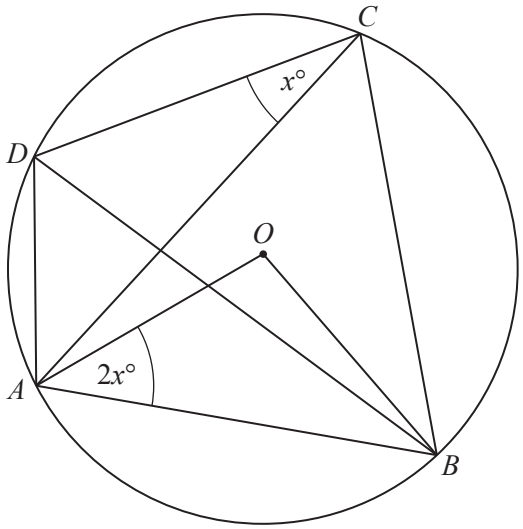
(a) passes the driving test at the second attempt,

..... [2]

(b) takes no more than three attempts to pass the driving test.

..... [2]

19



NOT TO SCALE

In the diagram, A, B, C and D lie on the circumference of a circle, centre O.
Angle $ACD = x°$ and angle $OAB = 2x°$.

Find an expression, in terms of x, in its simplest form for

(a) angle AOB,

Angle $AOB =$ ..... [1]

(b) angle ACB,

Angle $ACB =$ ..... [1]

(c) angle DAB.

Angle $DAB =$ ..... [2]

20 **(a)** Factorise.

$$18y - 3ay + 12x - 2ax$$

..... [2]

(b) Factorise.

$$3x^2 - 48y^2$$

..... [3]

21 **(a)** $3^{-2} \times 3^x = 81$

Find the value of x.

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

(b) $x^{-\frac{1}{3}} = 32x^{-2}$

Find the value of x.

$x =$ ..... [3]

22 $\mathbf{A} = \begin{pmatrix} 3 & 2 \\ -5 & 0 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} -2 & 5 \\ 4 & 1 \end{pmatrix}$ $\mathbf{C} = (-1 \quad k)$

(a) Find **AB**.

$\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$ [2]

(b) $\mathbf{CA} = (-13 \quad -2)$

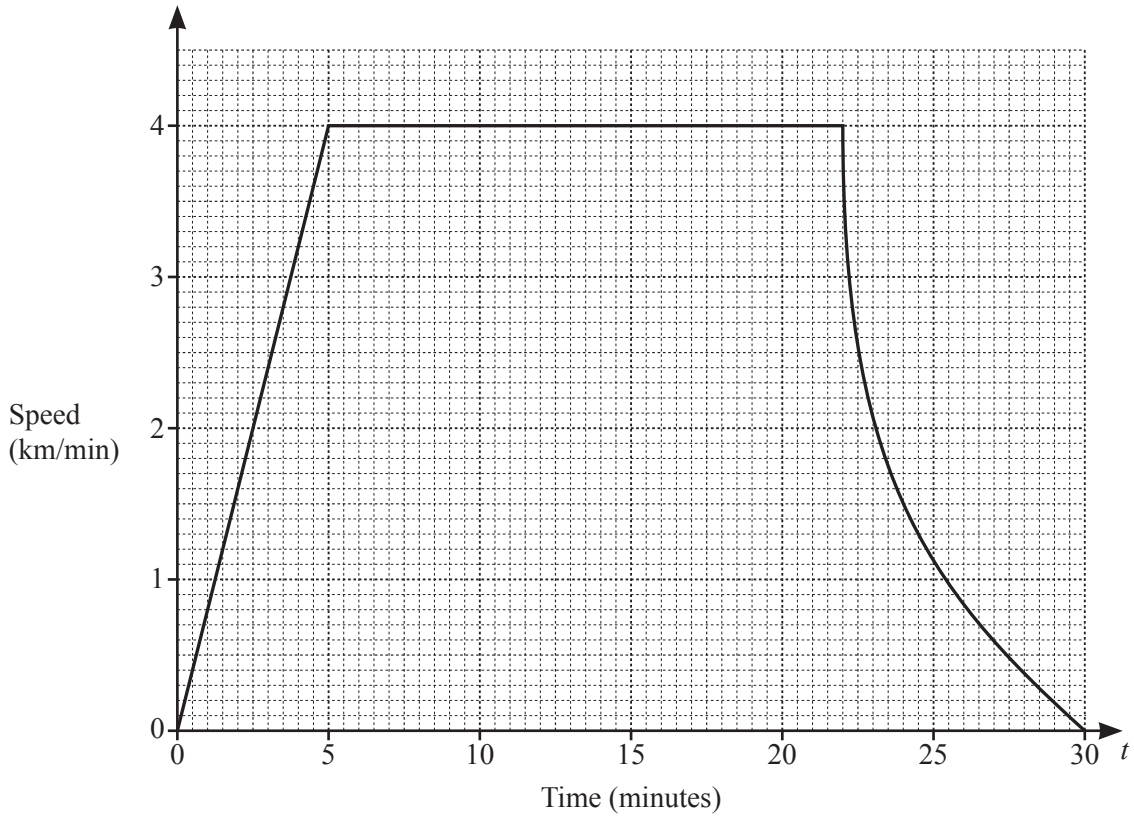
Find the value of k.

$k =$ ..... [2]

(c) Find $\mathbf{A}^{-1}$.

$\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$ [2]

23



The speed–time graph shows information about a train journey.

(a) By drawing a suitable tangent to the graph, estimate the gradient of the curve at $t = 24$.

..... [3]

(b) What does this gradient represent?

..... [1]

(c) Work out the distance travelled by the train when it is travelling at constant speed.

..... km [2]

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