Cambridge IGCSE

**Cambridge Assessment International Education**
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

*7334800620*

**MATHEMATICS** **0580/23**

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 $\pi$, 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 (KS/CGW) 172573/2
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**1** Write down the temperature that is 7 °C below −3 °C.

..... °C [1]

**2** Calculate $\sqrt{256^{0.25} + 4 \times 8}$.

..... [1]

**3** Here is a list of numbers.

87 77 57 47 27

From this list, write down

**(a)** a cube number,

..... [1]

**(b)** a prime number.

..... [1]

**4** Find the highest common factor (HCF) of 84 and 105.

..... [2]

**5** Write in standard form.

**(a)** 72000

..... [1]

**(b)** 0.0018

..... [1]

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**6** Expand and simplify $(x+3)(x+5)$.

..... [2]

**7** Find the gradient of the line that is perpendicular to the line $2y = 3 + 5x$.

..... [2]

**8** When $\sin x° = 0.36$, find

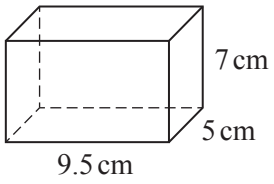
**(a)** the acute angle $x°$,

..... [1]

**(b)** the obtuse angle $x°$.

..... [1]

**9** A cuboid measures 5 cm by 7 cm by 9.5 cm.




NOT TO SCALE

Work out the surface area of this cuboid.

..... $cm^2$ [3]

**10** $5n$ is the mean of the three numbers 391, $n$ and $n - 1$.

Find the value of $n$.

$n =$ ..... [3]

**11** Factorise.

**(a)** $12x + 15$

..... [1]

**(b)** $xy - 2x + 3y - 6$

..... [2]

**12** $A$ is the point (2, 1) and $B$ is the point (9, 4).

Find the length of $AB$.

..... [3]

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**13** A straight line joins the points $(3k, 6)$ and $(k, -5)$.
The line has a gradient of 2.

Find the value of $k$.

$k =$ ..... [3]

**14** Find the $n$th term of each sequence.

**(a)** $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \frac{1}{10}, \ldots$

..... [1]

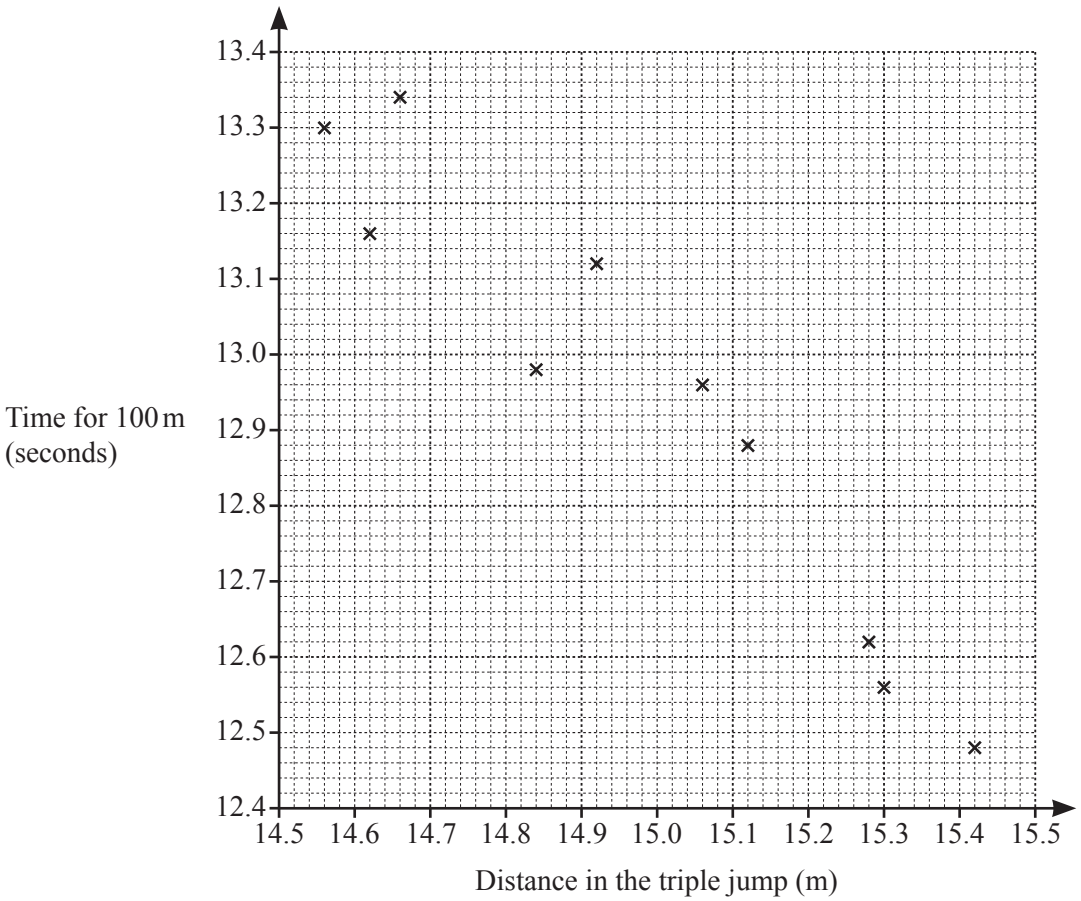
**(b)** 1, 5, 25, 125, 625, ...

..... [2]

**15** **Without using a calculator**, work out $\frac{2}{3} + \frac{1}{4} \times \frac{2}{3}$.
Write down all the steps of your working and give your answer as a fraction in its simplest form.

..... [4]

**16** Ten athletes compete in both the 100 metre race and the triple jump.
Their results are shown in the scatter diagram.




**(a)** One of these athletes jumps 15.12 m in the triple jump.

Write down his time for the 100 metre race.

..... s [1]

**(b)** The values for two other athletes are shown in the table.

| Distance in the triple jump (m) | 14.74 | 15.2 |
|---|---|---|
| Time for 100 m (seconds) | 13.2 | 12.76 |

On the scatter diagram, plot these points. [1]

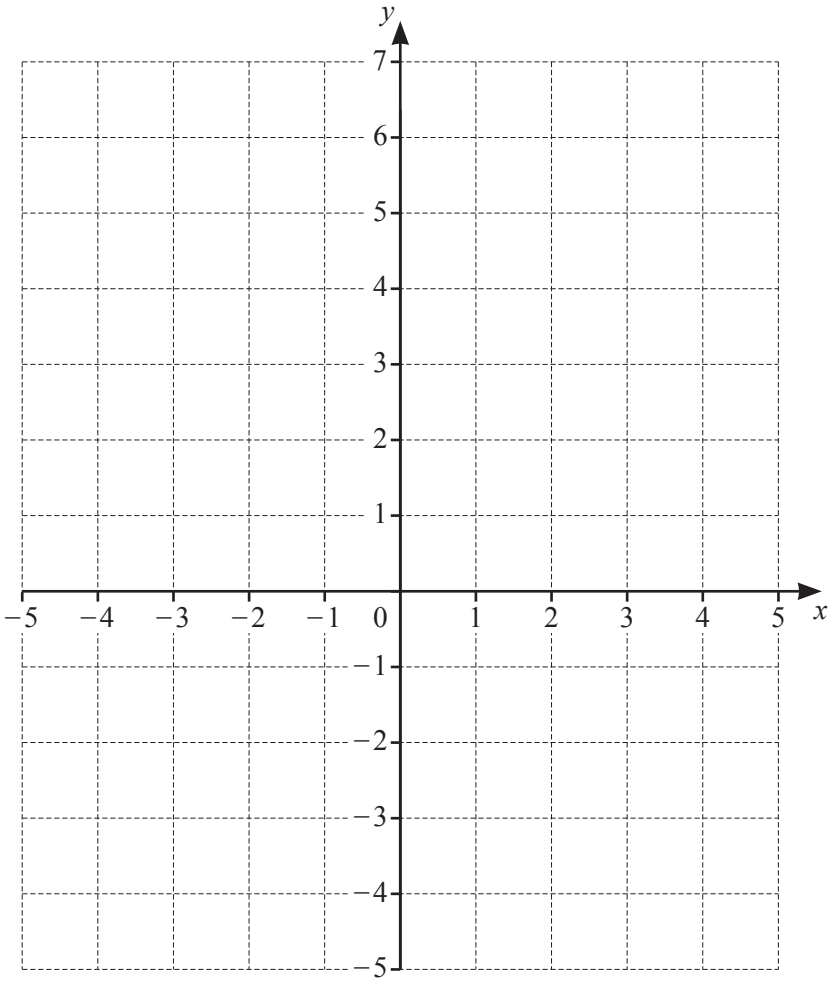
**(c)** On the scatter diagram, draw a line of best fit. [1]

**(d)** What type of correlation is shown in the scatter diagram?

..... [1]

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**17**




By shading the **unwanted** regions on the grid, draw and label the region $R$ that satisfies the following inequalities.

$$-2 < x \leqslant 3 \qquad\qquad y \leqslant x + 3$$

[4]

**18** **(a)** $M = \{x : x \text{ is an integer and } 2 \leqslant x < 6\}$

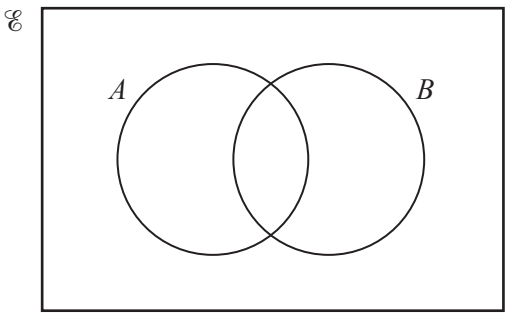
**(i)** Find n($M$).

..... [1]

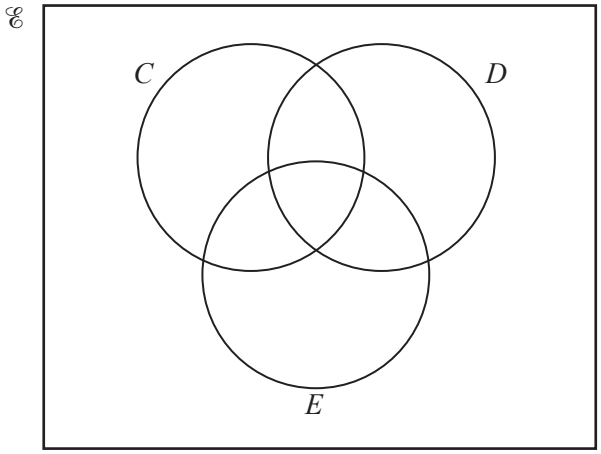
**(ii)** Write down a set $N$ where $N \subset M$ and $N \neq \varnothing$.

{.....} [1]

**(b)** In each Venn diagram, shade the required region.



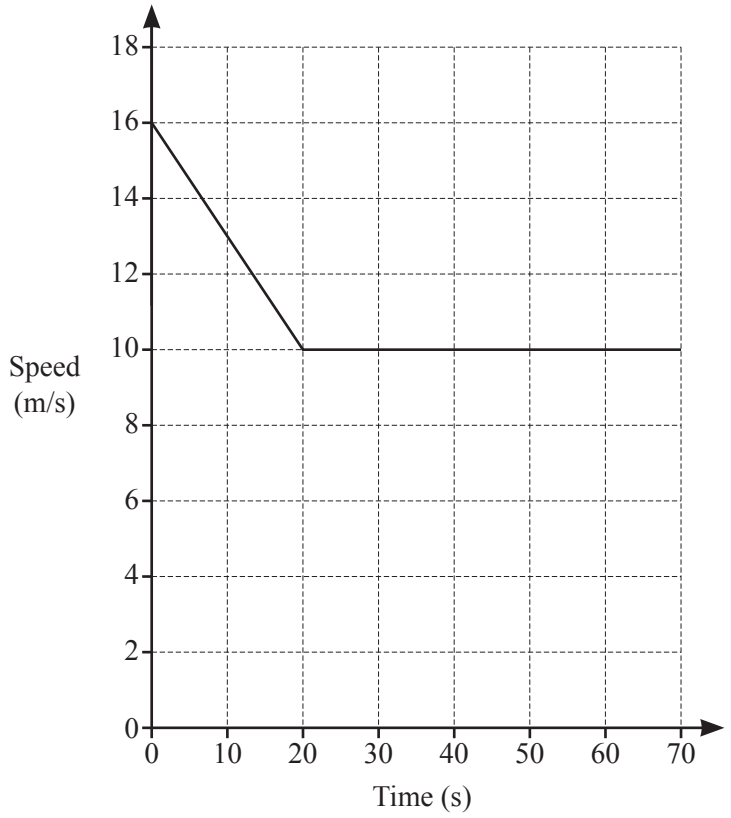

$(A \cup B)'$




$(C \cap D') \cup E$

[2]

**19**




The diagram shows the speed–time graph for 70 seconds of a car journey.

**(a)** Calculate the deceleration of the car during the first 20 seconds.

..... $m/s^2$ [1]

**(b)** Calculate the total distance travelled by the car during the 70 seconds.

..... m [3]

**20** $t$ is inversely proportional to the square of $(x + 1)$.
When $x = 2$, $t = 5$.

**(a)** Write $t$ in terms of $x$.

$t =$ ..... [2]

**(b)** When $t = 1.8$, find the positive value of $x$.

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

**21** **(a)** Work out the inverse of the matrix $\begin{pmatrix} -3 & 10 \\ 1 & -5 \end{pmatrix}$.

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

**(b)** Work out the value of $x$ and the value of $y$ in this matrix calculation.

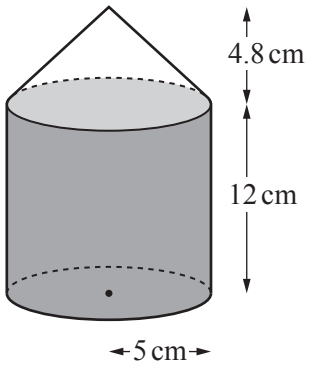
$$\begin{pmatrix} 1 & 5 \\ 2 & y \end{pmatrix}\begin{pmatrix} -4 & 1 \\ 2 & 9 \end{pmatrix} = \begin{pmatrix} x & 46 \\ 6 & 65 \end{pmatrix}$$

$x =$ .....

$y =$ ..... [3]

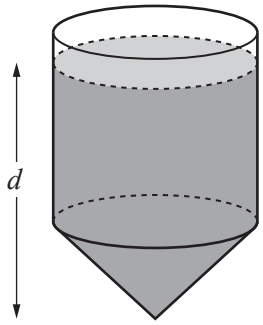
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**22** A container is made from a cylinder and a cone, each of radius 5 cm.
The height of the cylinder is 12 cm and the height of the cone is 4.8 cm.




NOT TO SCALE

The cylinder is filled completely with water.
The container is turned upside down as shown below.




NOT TO SCALE

Calculate the depth, *d,* of the water.
[The volume, $V$, of a cone with radius $r$ and height $h$ is $V = \frac{1}{3}\pi r^2 h$.]

$d$ = ..... cm [5]

**Question 23 is printed on the next page.**

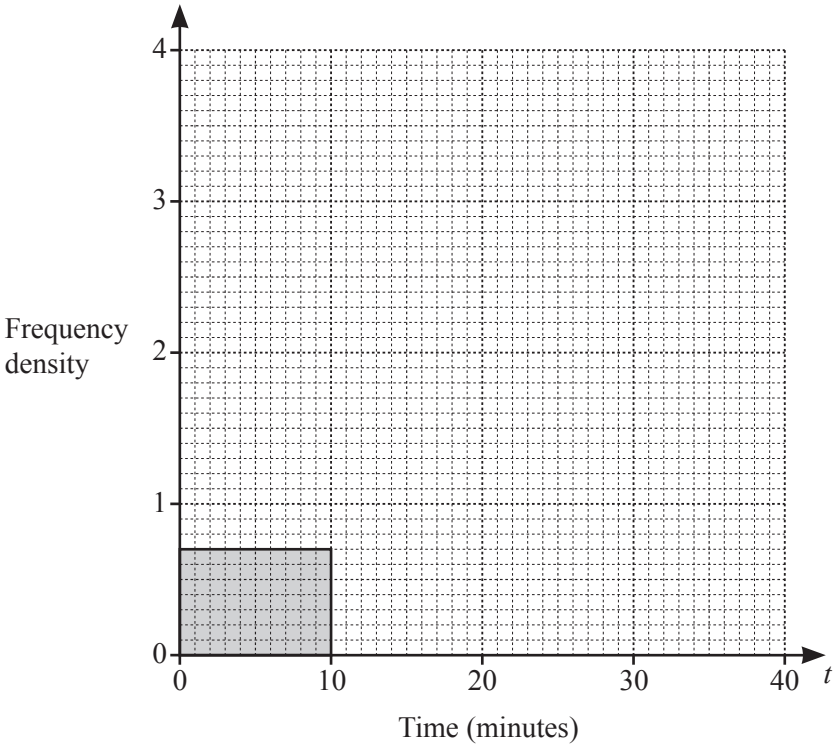
**23** The time, $t$ minutes, it takes each of 50 students to travel to school is recorded.
The table shows the results.

| Time ($t$ minutes) | $0 < t \leqslant 10$ | $10 < t \leqslant 15$ | $15 < t \leqslant 20$ | $20 < t \leqslant 40$ |
|---|---|---|---|---|
| Frequency | 7 | 19 | 16 | 8 |

**(a)** Write down the modal class.

..... $< t \leqslant$ ..... min [1]

**(b)** On the grid, complete the histogram to show the information in the table.




[3]

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