Cambridge IGCSE

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

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

*1416105171*

**MATHEMATICS** **0580/22**

Paper 2 (Extended) **May/June 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 (CE/CB) 166637/2
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**1** Write down a prime number between 50 and 60.

..... [1]

**2** Use your calculator to work out $\sqrt{1-(\sin 33°)^2}$.

..... [1]

**3** Write the recurring decimal $0.\dot{7}$ as a fraction.

..... [1]

**4** Complete each statement.

**(a)** A quadrilateral with only one pair of parallel sides is called a ..... . [1]

**(b)** An angle greater than 90° but less than 180° is called ..... . [1]

**5** The distance between Prague and Vienna is 254 kilometres.
The local time in Prague is the same as the local time in Vienna.
A train leaves Prague at 15 20 and arrives in Vienna at 19 50 the same day.

Calculate the average speed of the train.

..... km/h [2]

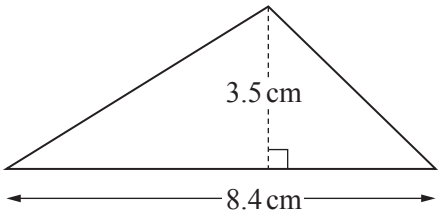
**6** Solve the equation.

$$9f + 11 = 3f + 23$$

$f =$ ..... [2]

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**7**




NOT TO SCALE

Calculate the area of this triangle.

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

**8** **(a)** Write 0.047 883 correct to 2 significant figures.

..... [1]

**(b)** Write 0.005 27 in standard form.

..... [1]

**9** Find the highest common factor (HCF) of 90 and 48.

..... [2]

**10** On a map with scale 1 : 25 000, the area of a lake is 33.6 square centimetres.

Calculate the actual area of the lake, giving your answer in square kilometres.

..... $km^2$ [2]

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**11** Write down the matrix that represents an enlargement, scale factor 3, centre (0, 0).

$\left(\quad\quad\right)$ [2]

**12** Simplify.

**(a)** $5m^2 \times 2m^3$

..... [2]

**(b)** $\left(x^8\right)^3$

..... [1]

**13** **Without using a calculator**, work out $2\frac{1}{4} \div \frac{3}{7}$.

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

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**14** Solve the simultaneous equations.
You must show all your working.

$$5x + 8y = 4$$
$$\tfrac{1}{2}x + 3y = 7$$

$x =$ .....

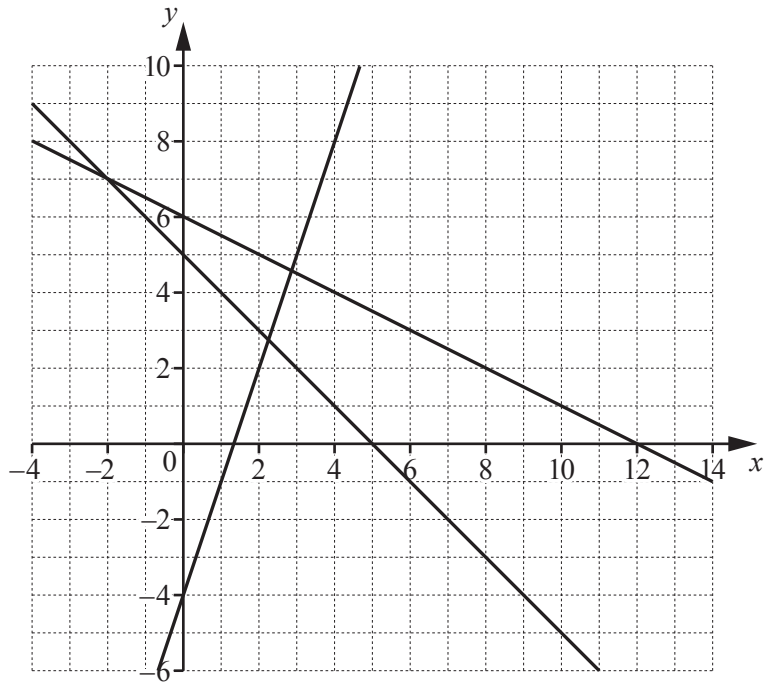
$y =$ ..... [3]

**15** Shona buys a chair in a sale for \$435.60 .
This is a reduction of 12% on the original price.

Calculate the original price of the chair.

\$..... [3]

**16**




$y \leqslant -\frac{1}{2}x + 6 \qquad y \geqslant 3x - 4 \qquad x + y \geqslant 5$

**(a)** By shading the **unwanted** regions of the grid, find and label the region $R$ that satisfies the three inequalities. [2]

**(b)** Find the largest value of $x + y$ in the region $R$, where $x$ and $y$ are integers.

..... [1]

**17** Write as a single fraction in its simplest form.

$$\frac{2x}{x+3} + \frac{x+3}{x-5}$$

..... [3]

**18** The table shows the number of people in different age groups at a cinema.

| Age ($y$ years) | $15 < y \leqslant 25$ | $25 < y \leqslant 30$ | $30 < y \leqslant 50$ | $50 < y \leqslant 80$ |
|---|---|---|---|---|
| Number of people | 35 | 32 | 44 | 12 |

Dexter draws a histogram to show this information.
The height of the bar he draws for the group $15 < y \leqslant 25$ is 7 cm.

Calculate the height of each of the remaining bars.

$25 < y \leqslant 30$ ..... cm

$30 < y \leqslant 50$ ..... cm

$50 < y \leqslant 80$ ..... cm [3]

**19** Rearrange this formula to make $m$ the subject.

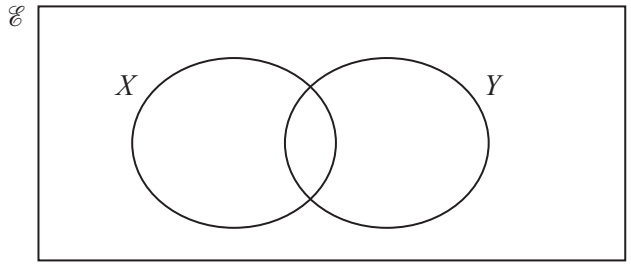
$$P = \frac{k+m}{m}$$

..... [4]

**20** Solve the equation $3x^2 - 2x - 10 = 0$.
Show all your working and give your answers correct to 2 decimal places.

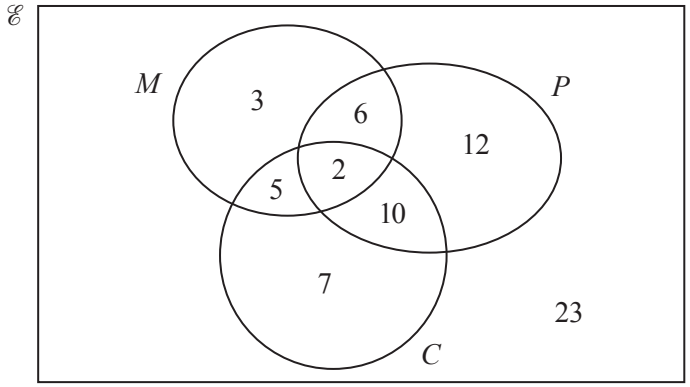
$x =$ ..... or $x =$ ..... [4]

**21** **(a)** In the Venn diagram, shade $X' \cap Y$.




[1]

**(b)** The Venn diagram below shows information about the number of gardeners who grow melons ($M$), potatoes ($P$) and carrots ($C$).




**(i)** A gardener is chosen at random from the gardeners who grow melons.

Find the probability that this gardener does not grow carrots.

..... [2]

**(ii)** Find $\mathrm{n}((M \cap P) \cup C')$.

..... [1]

**22** $\mathbf{A} = \begin{pmatrix} 2 & 7 \\ 1 & 3 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} 3 & 4 \\ 0 & 1 \end{pmatrix}$

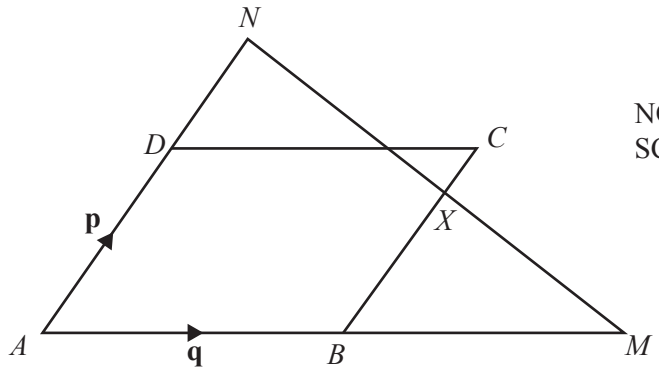
**(a)** Calculate **AB**.

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

**(b)** Find $\mathbf{A}^{-1}$, the inverse of **A**.

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

**23**




NOT TO SCALE

*ABCD* is a parallelogram with $\overrightarrow{AB} = \mathbf{q}$ and $\overrightarrow{AD} = \mathbf{p}$.
*ABM* is a straight line with $AB : BM = 1 : 1$.
*ADN* is a straight line with $AD : DN = 3 : 2$.

**(a)** Write $\overrightarrow{MN}$, in terms of **p** and **q**, in its simplest form.

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

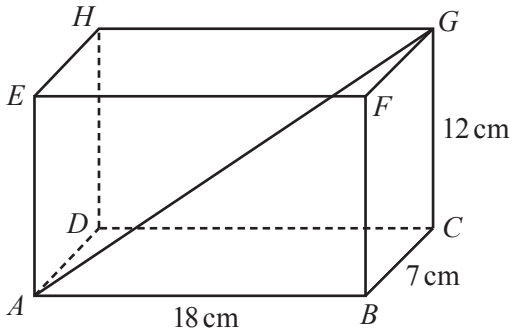
**(b)** The straight line *NM* cuts *BC* at *X*.
*X* is the midpoint of *MN*.
$\overrightarrow{BX} = k\mathbf{p}$

Find the value of *k*.

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

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**24**




NOT TO SCALE

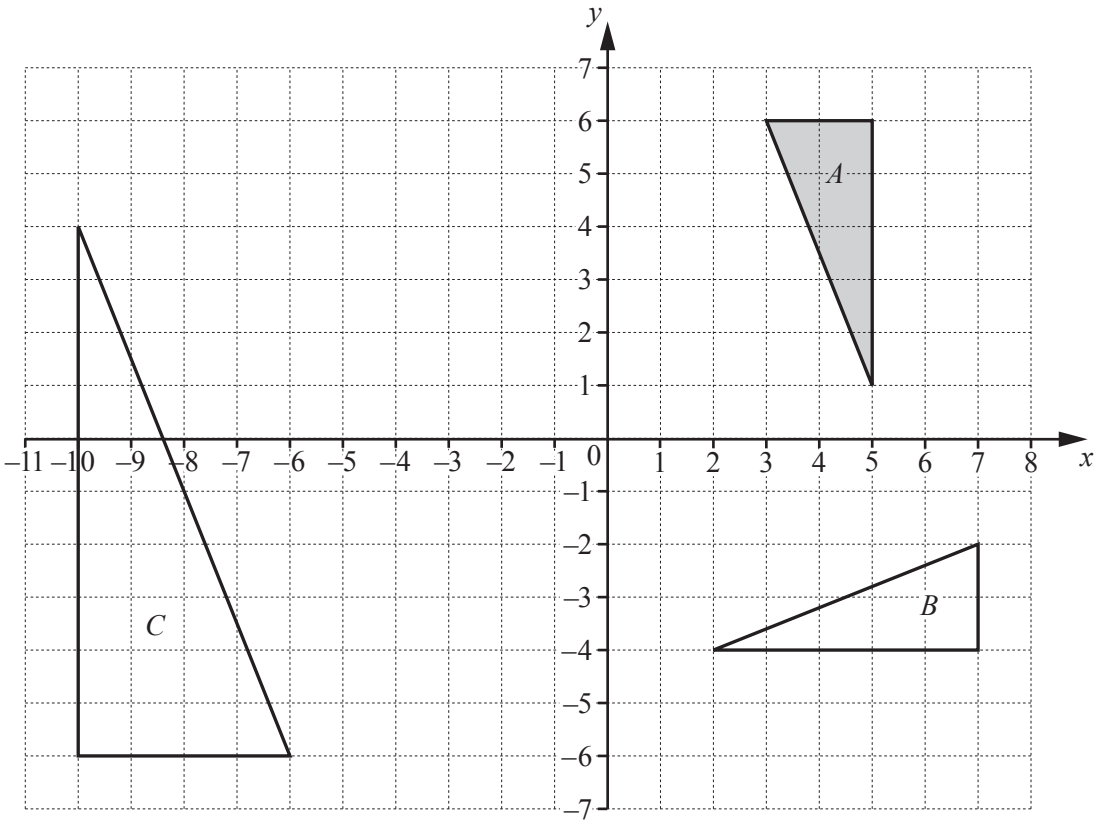
*ABCDEFGH* is a cuboid.
$AB = 18$ cm, $BC = 7$ cm and $CG = 12$ cm.

Calculate the angle that the diagonal *AG* makes with the base *ABCD*.

..... [4]

**Question 25 is printed on the next page.**

**25**




Describe fully the **single** transformation that maps

**(a)** triangle $A$ onto triangle $B$,

.....

..... [3]

**(b)** triangle $A$ onto triangle $C$.

.....

..... [3]

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