Instructions

• Use black ink or ball-point pen.
• Fill in the boxes at the top of this page with your name, centre number and candidate number.
• Answer all questions.
• Without sufficient working, correct answers may be awarded no marks.
• Answer the questions in the spaces provided – there may be more space than you need.
• Calculators may be used.
• You must NOT write anything on the formulae page. Anything you write on the formulae page will gain NO credit.

Information

• The total mark for this paper is 100.
• The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.

Advice

• Read each question carefully before you start to answer it.
• Check your answers if you have time at the end.
International GCSE MATHEMATICS

FORMULAE SHEET – FOUNDATION TIER

Pythagoras’ Theorem
\[ a^2 + b^2 = c^2 \]

Volume of cylinder = \( \pi r^2 h \)

Curved surface area of cylinder = \( 2\pi rh \)

Area of a trapezium = \( \frac{1}{2}(a + b)h \)

Volume of prism = area of cross section \( \times \) length

Circumference of circle = \( 2\pi r \)

Area of circle = \( \pi r^2 \)
Answer ALL NINETEEN questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 There are 3708 people at a football match.
   (a) Write the number 3708 in words.

   ..................................................................................................................................................................................................................................................

   (1)

   (b) Write the number 3708 correct to the nearest thousand.

   ..............................................................................................................................

   (1)

   2934 of the 3708 people are adults.
   The rest of the people are children.
   (c) How many children are at the football match?

   ..............................................................................................................................

   (1)

   24 buses took people to the football match.
   4 of these buses came from London.
   (d) What fraction of the buses came from London?
       Give your fraction in its simplest form.

   ..............................................................................................................................

   (2)

   There are 48 seats on one bus.
   \( \frac{1}{8} \) of the seats on this bus are empty.
   (e) How many seats are not empty?

   ..............................................................................................................................

   (2)

(Total for Question 1 is 7 marks)
2 The pictogram shows information about the number of emails Michael sent each day from Monday to Friday.

<table>
<thead>
<tr>
<th>Day</th>
<th>Pictogram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
</tr>
<tr>
<td>Wednesday</td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
</tr>
<tr>
<td>Saturday</td>
<td></td>
</tr>
</tbody>
</table>

(a) How many emails did Michael send on Monday?

(b) How many emails did Michael receive on Thursday?

(c) Show this information on the pictogram.

(Total for Question 2 is 4 marks)
3 The diagram shows two quadrilaterals and a triangle on a square grid.

(a) Measure the length of $DF$.
    State the units of your answer. 

(b) On the diagram, mark with arrows (>>) a pair of parallel lines.

(c) Write down the mathematical name of quadrilateral $ABEF$.

(d) On the diagram, mark an obtuse angle with the letter $O$.

(Total for Question 3 is 5 marks)
4. Write down all the factors of 40

(Total for Question 4 is 2 marks)

5. (a) Change 8 metres into centimetres.

....................................................... centimetres

(1)

(b) Change 9600 grams into kilograms.

....................................................... kilograms

(1)

Jamil has 5 litres of water in a container.
He pours 750 millilitres of water into each of 6 bottles.

(c) How much water is left in the container?
   Give your answer in millilitres.

....................................................... millilitres

(3)

(Total for Question 5 is 5 marks)
6  (a) Here is a probability scale.

A fair 6-sided dice is thrown.

Write down the letter of the arrow that points to the probability that the dice lands on

(i) the number 5

(ii) a number greater than 10

(iii) an even number.

Alice says that the probability it will rain tomorrow is 1.2
She cannot be right.

(b) Explain why.

Brett has a bag of counters and a box of counters.

1 red counter, 1 white counter, 1 blue counter and 1 yellow counter are in the bag.
1 green counter and 1 purple counter are in the box.

Brett takes at random a counter from the bag.
He then takes at random a counter from the box.

(c) (i) List all the possible combinations of coloured counters he could get.

(ii) Write down the probability that Brett takes a red counter and a green counter.
7  (a) Shade 70% of this shape.

(b) Write 23% as a fraction.

(c) Write 6% as a decimal.

14% of the workers in a factory work part time.

(d) What percentage of the workers in the factory do not work part time?

(e) Work out 14% of 350

(Total for Question 7 is 6 marks)
8 (a) Solve $4e = 20$

\[ e = \frac{20}{4} \]

(b) Solve $15 - f = 9$

\[ f = \frac{15 - 9}{1} \]

(c) Simplify $5m + 4p - 2m + 7p$

\[ 3m + 11p \]

There are 4 pens in each small box of pens.
There are 10 pens in each large box of pens.

Harry buys $x$ small boxes of pens and $y$ large boxes of pens.

(d) Write down an expression, in terms of $x$ and $y$, for the total number of pens Harry buys.

\[ 4x + 10y \]

(e) Work out the value of $2a^2 + 6c$

\[ a = -5 \]
\[ c = -2 \]

\[ 2(-5)^2 + 6(-2) = 50 - 12 = 38 \]

(Total for Question 8 is 8 marks)
9. Here are six quadrilaterals.

(a) Write down the mathematical name for quadrilateral C.

[Diagram of quadrilaterals A, B, C, D, E, F]

Two of the quadrilaterals have **no** lines of symmetry.

(b) Write down the letters of these two quadrilaterals.

[Diagrams of quadrilaterals A, B, C, D, E, F]

Two of the quadrilaterals have 2 lines of symmetry **and** rotational symmetry of order 2

(c) Write down the letters of these two quadrilaterals.

[Diagrams of quadrilaterals A, B, C, D, E, F]
(d) On the grid, reflect the shaded shape in the mirror line.

Here is a different quadrilateral.

(e) Work out the size of the angle marked $x$.

(Total for Question 9 is 8 marks)
Kevin left his home at 1000 to cycle to a lake. On the way, he stopped at a friend’s house and then continued his journey to the lake. Here is the distance-time graph for his journey to the lake.

(a) For how many minutes did Kevin stop at his friend’s house?

....................................................... minutes

(b) How far is the lake from Kevin’s home?

....................................................... km

Kevin stayed at the lake until 1315
He then cycled, without stopping, at a constant speed from the lake back to his home.
It took Kevin \(1 \frac{1}{4}\) hours to cycle home.

(c) (i) Show all this information on the graph.

(ii) Work out Kevin’s speed as he cycled from the lake back to his home.

....................................................... km/h

(Total for Question 10 is 6 marks)
The table shows information about the number of visits each of 40 adults made to the gym last week.

<table>
<thead>
<tr>
<th>Number of visits to the gym</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

(a) Write down the mode of the number of visits to the gym.

.......................................................

(1)

(b) Find the median of the number of visits to the gym.

.......................................................

(2)

(c) Work out the mean of the number of visits to the gym.

.......................................................

(3)

One of these adults is chosen at random.

(d) Write down the probability that this adult made more than 5 visits to the gym last week.

.......................................................

(2)

(Total for Question 11 is 8 marks)
12  \( A = \{2, 4, 6, 8, 10, 12, 14\} \)
\( B = \{1, 3, 5, 7, 9, 11, 13\} \)
\( C = \{3, 6, 9, 12\} \)

(a) Complete the following sentence.

All the numbers in set \( C \) are \underline{multiples} of 3

(b) List the members of the set

(i) \( A \cap C \)

..........................................................................................(1)

(ii) \( A \cup C \)

..........................................................................................(2)

(c) Explain why \( A \cap B = \emptyset \)

..........................................................................................

(Total for Question 12 is 4 marks)
13 Here are the ingredients needed to make 12 muffins.

<table>
<thead>
<tr>
<th>Ingredients to make 12 muffins</th>
</tr>
</thead>
<tbody>
<tr>
<td>300g flour</td>
</tr>
<tr>
<td>150g sugar</td>
</tr>
<tr>
<td>250ml milk</td>
</tr>
<tr>
<td>100g butter</td>
</tr>
<tr>
<td>2 eggs</td>
</tr>
</tbody>
</table>

Sarah makes 60 muffins.

(a) Work out how much sugar she uses.

…………………………… g

(2)

James makes some muffins.
He uses 625 ml of milk.

(b) How many muffins did he make?

……………………………

(2)

(Total for Question 13 is 4 marks)
14 On the grid, draw the graph of \( y = 3x - 5 \) for values of \( x \) from \(-2\) to \(3\).
15 (a) Show that \( \frac{3}{10} + \frac{2}{15} = \frac{13}{30} \)

(b) Show that \( 2 \frac{5}{8} + 1 \frac{1}{6} = 2 \frac{1}{4} \)

(Total for Question 15 is 5 marks)
16 (a) Factorise \( 3y^2 + 2y \) 

(b) Expand and simplify \((x - 9)(x + 2)\) 

(c) (i) Solve \( 6k + 5 < 20 \) 

(ii) \( n \) is an integer and \( 6n + 5 < 20 \)  

Write down the largest possible value of \( n \) 

(Total for Question 16 is 6 marks)
Work out the length of $AB$.
Give your answer correct to 1 decimal place.

....................................................... cm

(Total for Question 17 is 3 marks)
18 Bhavin, Max and Imran share 6000 rupees in the ratios $2 : 3 : 7$

Imran then gives $\frac{3}{5}$ of his share of the money to Bhavin.

What percentage of the 6000 rupees does Bhavin now have?
Give your answer correct to the nearest whole number.

....................................................... %

(Total for Question 18 is 5 marks)
19 The diagram shows a circle inside a rectangle.

Diagram NOT accurately drawn

Work out the area of the shaded region.
Give your answer correct to 3 significant figures.

\[
\text{cm}^2
\]

(Total for Question 19 is 3 marks)