Please write clearly in block capitals.

Centre number |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |

Candidate number


Surname
Forename(s)
Candidate signature

## GCSE

## Mathematics

Foundation


## Summer 2019

Time allowed: 1 hour 30 minutes

## Materials

For this paper you must have:

- a calculator
- mathematical instruments.



## Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.


## Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80 .
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to the answer book.


## Advice

- In all calculations, show clearly how you work out your answer.

| For Examiner's Use |  |
| :---: | :---: |
| Pages | Mark |
| 3 |  |
| $4-5$ |  |
| $6-7$ |  |
| $8-9$ |  |
| $10-11$ |  |
| $12-13$ |  |
| $14-15$ |  |
| $16-17$ |  |
| $18-19$ |  |
| $20-21$ |  |
| $22-23$ |  |
| $24-25$ |  |
| $26-27$ |  |
| TOTAL |  |

## Practice Paper Overview

| Q | Topic | Mark | Total |
| :---: | :---: | :---: | :---: |
| 1 | Negative Numbers |  | 1 |
| 2 | Algebraic Expressions |  | 1 |
| 3 | Units of Measure |  | 1 |
| 4 | Rotational Symmetry |  | 1 |
| 5 | Using a Calculator |  | 2 |
| 6 | Pictogram |  | 2 |
| 7 | Function Machines |  | 3 |
| 8 | Number Problem |  | 3 |
| 9 | Nets, Plans and Elevations |  | 2 |
| 10 | Sequences |  | 3 |
| 11 | Percentage and Money Problem |  | 5 |
| 12 | Ratio Problem |  | 3 |
| 13 | Parts of a circle |  | 1 |
| 14 | Percentage Problem |  | 4 |
| 15 | Simplify and Solve |  | 4 |
| 16 | Speed Distance Time |  | 2 |
| 17 | Pie Chart Problem |  | 4 |
| 18 | Right Angled Trigonometry |  | 2 |
| 19 | Product of Prime Factors |  | 3 |
| 20 | Frequency Tree |  | 3 |
| 21 | Form and Solve Equations |  | 5 |
| 22 | Inequalities |  | 1 |
| 23 | Parallel Lines |  | 1 |
| 24 | Combinations |  | 2 |
| 25 | Error Interval |  | 2 |
| 26 | Mean from a table |  | 4 |
| 27 | Direct Proportion |  | 3 |
| 28 | Angles in Polygons |  | 2 |
| 29 | Probability Problem |  | 5 |
| 30 | Compound Interest |  | 5 |
|  |  |  | 80 |

1 Circle the lowest of these temperatures.
$-2.6^{\circ} \mathrm{C}$
$6.2^{\circ} \mathrm{C}$
$-6^{\circ} C$
$0^{\circ} \mathrm{C}$
$0.3^{\circ} \mathrm{C}$

2 Circle the expression that is five times smaller than $n$.
$n-5$
$5 n$
$n+5$
$\frac{n}{5}$
$n^{5}$

3 Which unit is most suitable for measuring the length of a football pitch?
Circle your answer.
millimetres centimetres metres kilometres

$5 \quad$ Work out the value of $\quad \sqrt{5678}-2^{7}$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer $\qquad$

6 The pictogram shows the number of bags sold by a shop on
Thursday, Friday and Saturday of one week.


12 people buy a bag on Thursday.

6 (a) Complete the key.

6 (b) How many people buy a bag on Saturday.
$\qquad$
$\qquad$
$\qquad$

Answer $\qquad$

7 Here is a number machine.


7 (a) Work out the output when the input is 7
$\qquad$
$\qquad$
$\qquad$

Answer
7 (b) Work out the input when the output is 3
$\qquad$
$\qquad$
$\qquad$

Answer
7 (c) Work out the output when the input is $2 x$
$\qquad$
$\qquad$
$\qquad$

Answer $\qquad$

8 In this magic square each row, column and diagonal sum to make 21.

| 6 |  | 10 |
| :---: | :---: | :---: |
| 11 |  |  |
|  | 9 |  |

Fill in the missing numbers.
[3 marks]
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

9 A solid cuboid is made from centimetre cubes.
The plan view, front elevation and side elevation are shown.


Plan view


Front elevation


Side elevation

How many centimetre cubes were used to make the cuboid?
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer $\qquad$

10 The diagram shows a sequence of patterns.


Pattern 1


Pattern 2


Pattern 3


Pattern 4

10 (a) Work out the number of triangles in pattern 7
$\qquad$
$\qquad$

## Answer

10 (b) Complete the rule below.
[1 mark]

Number of triangles $=$ Pattern number $X$


10 (c) Which pattern number has 35 triangles
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer $\qquad$

11 Liam works Tuesday, Wednesday and Thursday.
He starts work at 5.00 pm and finishes at 9.30 pm .
Liam is paid $£ 4.35$ an hour on week days.
One week he also works for 5 hours on both Saturday and Sunday.
He is paid $20 \%$ more on a weekend.
How much does Liam earn altogether this week?
[5 marks]
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer

12 The angles in a triangle are in the ratio 2:3:4.
Lewis says
"This is a right-angled triangle".
Is Lewis correct?


Show your reasoning.
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer $\qquad$

13 Here is a circle


Circle the word that describes the shaded part.
chord
Segment

14 Teachers need to pass literacy and numeracy tests before they can qualify.
The,
Literacy test has 80 marks
Numeracy test has 70 marks.

A trainee teacher scores
$85 \%$ on the Literacy test
$90 \%$ on the Numeracy test

To pass and become a teacher you need to score $87 \%$ of the total marks.
Does the trainee teacher pass?
You must show your working out.
[4 marks]
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer $\qquad$

15 (a) Simplify

$$
\frac{6 x^{2} y^{4}}{9 x y^{5}}
$$

[2 marks]
$\qquad$
$\qquad$
$\qquad$

## Answer

15 (b) Solve

$$
\frac{x-10}{4}=6
$$

[2 marks]

Answer

16
This table shows information about journeys X and Y .

|  | Distance <br> travelled | Time taken | Average <br> speed |
| :---: | :---: | :---: | :---: |
| $\mathbf{X}$ |  | 2 hour 15 minutes | 56 mph |
| $\mathbf{Y}$ | 33 miles |  | 66 mph |

Complete the table.
[2 marks]
$\qquad$
$\qquad$
$\qquad$
$\qquad$

17 The pie chart shows some information about the medals the
United States received at the Rio Olympics in 2016.


The angle for gold would be $24^{\circ}$ more than the angle for Silver.
There were 120 medals in total.
Work out the number of silver medals.
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer

18 Work out the length $x$.
[2 marks]

$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer cm

19 Express 1320 as a product of its prime factors in index form.

Answer $\qquad$

2080 adults visited the opticians.
The customers were male and female in the ratio of 5:3.
$\frac{2}{5}$ of the male customers needed to wear glasses.
$47.5 \%$ of the customers need glasses.
Complete the frequency tree.

$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

21 This is a square.


Work out the perimeter of the square.
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer

22 Circle the inequality that represents the solution set on the number line.


$$
\begin{array}{ll}
-3<x<4 & -3 \leq x<4 \\
-3<x \leq 4 & -3 \leq x \leq 4
\end{array}
$$

23 Circle the equation of a line that is parallel to $y=4 x-3$

$$
\begin{gathered}
y=3 x-4 \quad y-4 x=3 \quad y=\frac{x}{3}+4 \\
y=-4 x+3 \quad y=3-\frac{1}{4} x
\end{gathered}
$$

24 Yasin uses four cards to make 4-digit numbers.


How many different 4-digit numbers can he make that are less than 3000 ?
[2 marks]
$\qquad$
$\qquad$
$\qquad$
Answer

25 The length of a cut piece of rope, $l$, is 15.3 cm correct to one decimal place. Write down the error interval for the length of the piece of rope.
[2 marks]
$\qquad$
$\qquad$
$\qquad$
$\leq l<$ $\qquad$

26 Here is some information about 40 buses arriving back at the bus depot.

| Number of <br> minutes late, $\mathbf{t}$ | Number of <br> buses | Midpoint |  |
| :---: | :---: | :---: | :--- |
| $0 \leq t<5$ | 8 |  |  |
| $5 \leq t<15$ | 11 |  |  |
| $15 \leq t<20$ | 15 |  |  |
| $20 \leq t<30$ | 6 |  |  |
| $t \geq 30$ | 0 |  |  |

26 (a) Work out an estimate of the mean number of minutes late.
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer $\qquad$

26 (b) The depot manager scrutinises the information in more detail.

| Number of <br> minutes late, $\mathbf{t}$ | Number of <br> buses |
| :---: | :---: |
| $0 \leq t<5$ | 8 |
| $5 \leq t<10$ | 0 |
| $10 \leq t<15$ | 11 |
| $15 \leq t<20$ | 15 |
| $20 \leq t<25$ | 1 |
| $25 \leq t<30$ | 5 |
| $t \geq 30$ | 0 |

She works out an estimate of the mean using this information.
How does her estimate compare with the answer to part (a)?
Tick one box.


Lower than part (a)


Same as part (a)


Higher than part (a)


Not possible to tell
$27 y$ is directly proportional to the square of $x$.

| $x$ | 2 | 3 | $b$ |
| :---: | :---: | :---: | :---: |
| $y$ | $a$ | 36 | 100 |

Work out the value of $a$ and $b$.
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

$$
a=\quad b=
$$

$\qquad$

28 A shape has an exterior angle of $36^{\circ}$.


How many sides does the shape have?
$\qquad$
$\qquad$
$\qquad$

Answer

29 A bag contains counters that are purple, yellow, blue and white.

| Counter | Purple | Yellow | Blue | White |
| ---: | :---: | :---: | :---: | :---: |
| Probability | 22 | $2 x$ | $x+5$ | $3 x+7$ |

A counter is chosen at random.
The probability the counter is purple is $\frac{11}{50}$.
Work out the probability it is white.
[5 marks]
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer

30 The value of a house $£ V$ is given by

$$
V=154000 \times 1.005^{t}
$$

30 (a) Write down the value of the house when $t=0$

Answer
30 (b) What is the value of the house after 4 years?
$\qquad$
$\qquad$
$\qquad$

Answer
30 (c) After how many years will the house's value be above $£ 160000$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Answer $\qquad$

## End of Questions

