Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

# GCSE
# MATHEMATICS

**F**

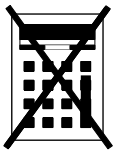
Foundation Tier Paper 1 Non-Calculator

Thursday 2 November 2017 Morning Time allowed: 1 hour 30 minutes

## Materials

For this paper you must have:
- mathematical instruments

You must **not** use a calculator.



## 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 this answer book.

## Advice

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

| For Examiner's Use | |
|---|---|
| Pages | Mark |
| 2–3 | |
| 4–5 | |
| 6–7 | |
| 8–9 | |
| 10–11 | |
| 12–13 | |
| 14–15 | |
| 16–17 | |
| 18–19 | |
| 20–21 | |
| 22–23 | |
| 24–25 | |
| 26–27 | |
| 28–29 | |
| **TOTAL** | |

Answer **all** questions in the spaces provided

**1** Circle the decimal which has the same value as $\frac{3}{5}$

**[1 mark]**

0.06 0.35 0.6 3.5

**2** How many millimetres are there in 7.5 centimetres?

Circle your answer.

**[1 mark]**

0.75 70.5 75 750 7500

**3** Which of these shapes has two lines of symmetry?

Circle your answer.

**[1 mark]**

Semicircle Rhombus Trapezium Isosceles triangle

**4** Circle the number that is 7 less than –12

**[1 mark]**

–19 –5 5 19

**5 (a)** Solve $x - 3 = 14$

**[1 mark]**

$x =$

**5 (b)** Solve $5y = 45$

**[1 mark]**

$y =$

**5 (c)** Solve $8 + w = 6$

**[1 mark]**

$w =$

**7**

**6 (a)** Work out 9174 ÷ 11

**[2 marks]**

Answer _____

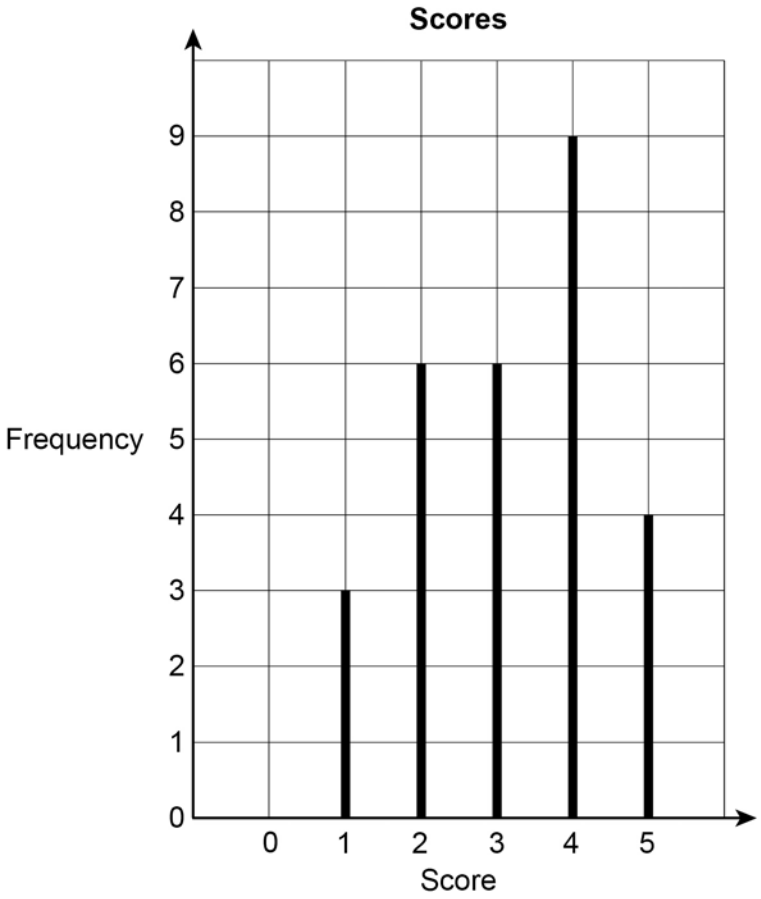
**6 (b)** Work out $\frac{5}{6} + \frac{3}{7}$

Give your answer as a mixed number.

**[3 marks]**

Answer

**7** The diagram shows the scores given by judges during a television show.




**7 (a)** Which score was the mode?

**[1 mark]**

Answer _____

**7 (b)** There were 4 judges.
Each judge gave one score in each round.

How many rounds were there?

**[3 marks]**

9

Answer _____

**8** A library book was due to be returned on 27 September.

It was actually returned on 14 October.

There is a fine of 8p for every day the book is late.

Work out the total fine.

**[3 marks]**

Answer £ _____

**9** In a game, three stars are hidden at random.

Each star is behind a different square on this board.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| **1** | | | | | |
| **2** | | | | | |
| **3** | | | | | |
| **4** | | | | | |
| **5** | | | | | |

**9 (a)** A square is chosen at random.

What is the probability that there is a star behind it?

**[1 mark]**

Answer _____

**9 (b)** In one game, the stars are behind three consecutive squares.
The squares are in one row or one column.
One of the squares is E2

Write down **all** the possible pairs for the other two squares.

**[2 marks]**

**6**

Answer _____

**10** Complete the table to show equivalent fractions and percentages.

**[3 marks]**

| **Fraction** | **Percentage** |
|---|---|
| $\frac{1}{2}$ | 50% |
| $\frac{3}{10}$ | |
| | 43% |
| $\frac{5}{2}$ | |

**11 (a)** Cards in a pack are red or blue in the ratio

red : blue = 2 : 3

What fraction of the cards are **red**?
Circle your answer.

**[1 mark]**

$\frac{5}{6}$ $\frac{2}{3}$ $\frac{2}{5}$ $\frac{3}{5}$

**11 (b)** A different pack has 72 cards.

$\frac{5}{9}$ are yellow.

Work out the number of yellow cards.

**[2 marks]**

Answer

**Turn over for the next question**

**6**

**12 (a)** How many edges are there on a square-based pyramid?

Circle your answer.

**[1 mark]**

4 5 8 12

**12 (b)** How many faces of a triangular prism are triangles?

Circle your answer.

**[1 mark]**

2 3 4 5

**13** A bus can be early, on time or late.

The probability that the bus is early is 0.1

The probability that the bus is on time is 0.6

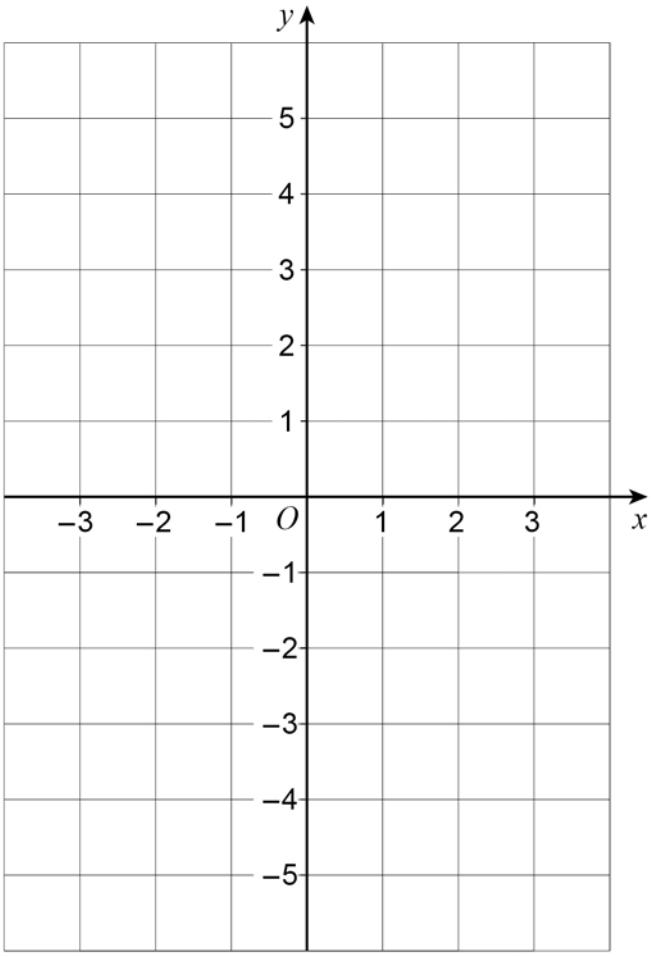
Work out the probability that the bus is late.

**[2 marks]**

Answer _____

**14** On the grid, draw the graph of $x + y = 2$ for values of $x$ from –3 to 3

**[2 marks]**




**Turn over for the next question**

6

**15** 5% of a number is 31

1% of the same number is 6.2

Work out 13% of the number.

**[3 marks]**

Answer _____

**16** Complete the grid so that when you

multiply the three numbers in any column, row or diagonal the answer is 1

**[3 marks]**

| | |
|---|---|
| 10 | $\frac{1}{2}$ |
| $\frac{1}{20}$ | 20 |
| 2 | 5 |

**Turn over for the next question**

**6**

**17** A sequence has three terms.

The term-to-term rule for the sequence is

multiply by 8 and then add 11

**17 (a)** The first term of the sequence is –1

Work out the third term.

**[2 marks]**

Answer

**17 (b)** The order of the three terms is reversed to make a new sequence.

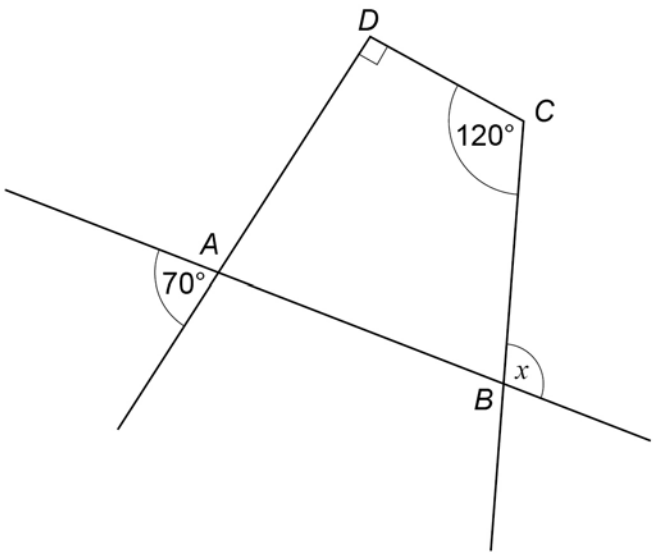
Work out the term-to-term rule for this sequence.

**[1 mark]**

Answer

**18** *ABCD* is a quadrilateral.

Sides are extended as shown.




Not drawn accurately

Show that $x = 100°$

**[3 marks]**

**Turn over for the next question**

**6**

**19** Use 2 gallons = 9 litres to convert 17 gallons into litres.

**[3 marks]**

Answer _____ litres

**20** $n$ is an odd number.

$p$ is a prime number.

In each part write down possible values of $n$ and $p$ so that

**20 (a)** $n + p$ is a square number.

**[1 mark]**

$n =$ $p =$

**20 (b)** $np$ is a square number.

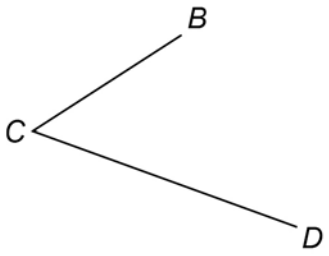
**[1 mark]**

$n =$ $p =$

**Turn over for the next question**

5

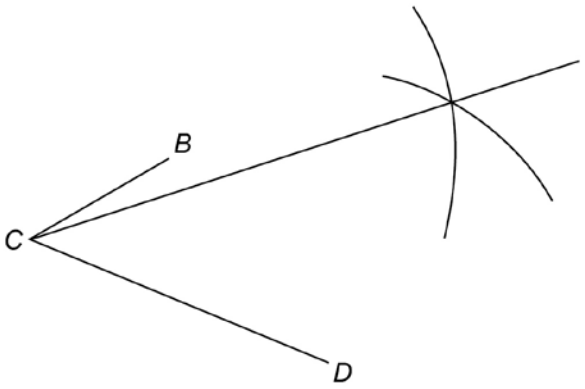
**21 (a)** Joe wants to bisect angle *BCD*.




Here is his method.

Use a pair of compasses to draw arcs of the same radius from *B* and *D*.

Draw a straight line from *C* through the intersection of the arcs.




Write down the error in his method.

**[1 mark]**

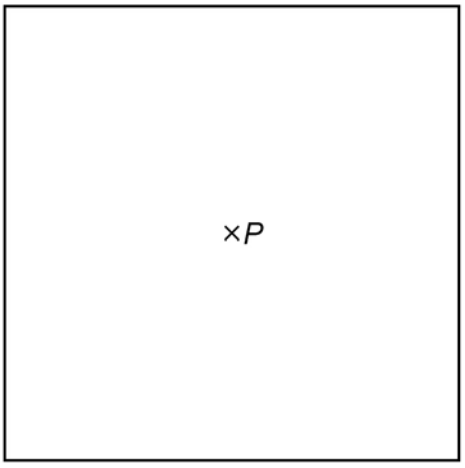
**21 (b)** Kay wants to show all the points 3 km from point *P*.

Scale: 1 cm represents 1 km

×*P*

Here is her answer.

Scale: 1 cm represents 1 km



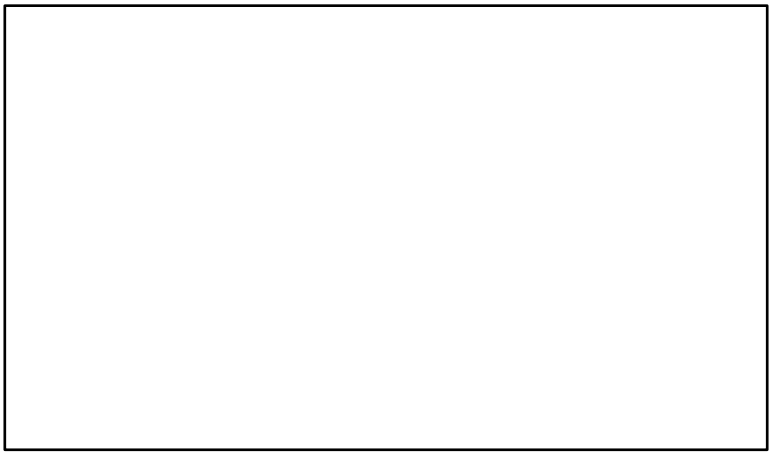

What is wrong with her answer?

**[1 mark]**

**Question 21 continues on the next page**

**2**

**21 (c)** Here is a rectangle.



Using a pair of compasses and a straight edge, construct **one** line of symmetry.

Show clearly your construction arcs.

**[2 marks]**

**22** $x : y = 7 : 4$

$x + y = 88$

Work out the value of $x - y$

**[3 marks]**

Answer _____

**Turn over for the next question**

5

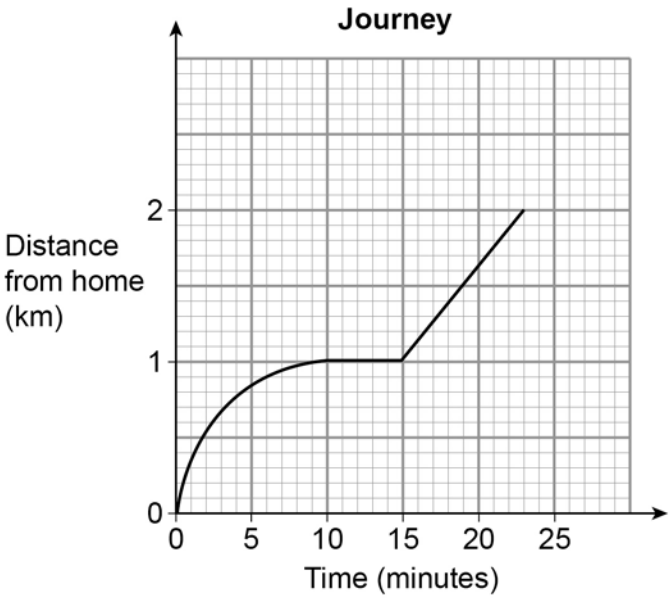
**23** Anil's home is 1 km from a shop.

He walked from home to the shop at a constant speed in 10 minutes.

He stayed at the shop for 5 minutes.

He walked home at a constant speed in 8 minutes.

Anil drew this distance-time graph to represent his journey.




Make **two** criticisms of his graph.

**[2 marks]**

Criticism 1 _____

Criticism 2

_____

_____

**24** Three **whole** numbers are each rounded to the nearest 10

The sum of the rounded numbers is 70

Work out the **maximum** possible sum for the original three numbers.

**[2 marks]**

Answer _____

**25** Circle the expression for the range of $n$ consecutive integers.

**[1 mark]**

$\frac{n+1}{2}$ $n-1$ $n$ $n+1$

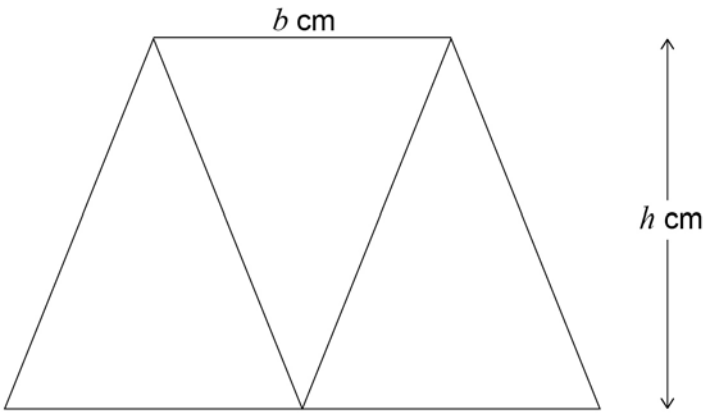
**Turn over for the next question**

5

**26** Three identical isosceles triangles are joined to make this trapezium.

Each triangle has base $b$ cm and perpendicular height $h$ cm

Not drawn accurately




**26 (a)** Work out an expression, in terms of $b$ and $h$, for the area of the trapezium.

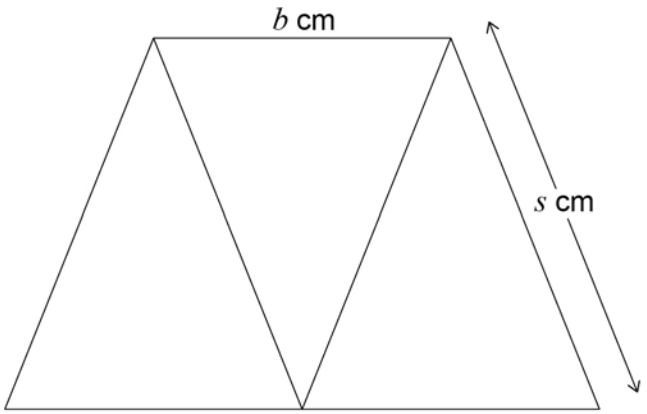
Give your answer in its simplest form.

**[2 marks]**

Answer cm$^2$

**26 (b)** This diagram shows the same trapezium.

Not drawn accurately




$b : s = 2 : 3$

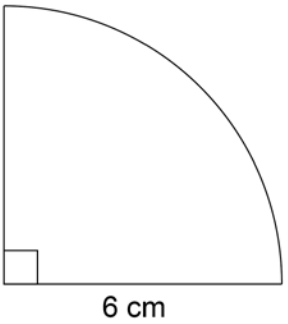
Work out an expression, in terms of $b$, for the perimeter of the trapezium.

Answer cm

**Turn over for the next question**

4

**27** Here is a quarter circle of radius 6 cm




Not drawn accurately

Work out the area of the quarter circle.

Give your answer in terms of $\pi$.

**[2 marks]**

Answer _____ $cm^2$

**28 (a)** Write in standard form 12 500

**[1 mark]**

Answer _____

**28 (b)** Write as an ordinary number $3.4 \times 10^{-2}$

**[1 mark]**

Answer _____

**29** Work out the value of $\left(\sqrt{3}\right)^2 \times \left(\sqrt{2}\right)^2$

**[2 marks]**

_____

_____

_____

Answer _____

**Turn over for the next question**

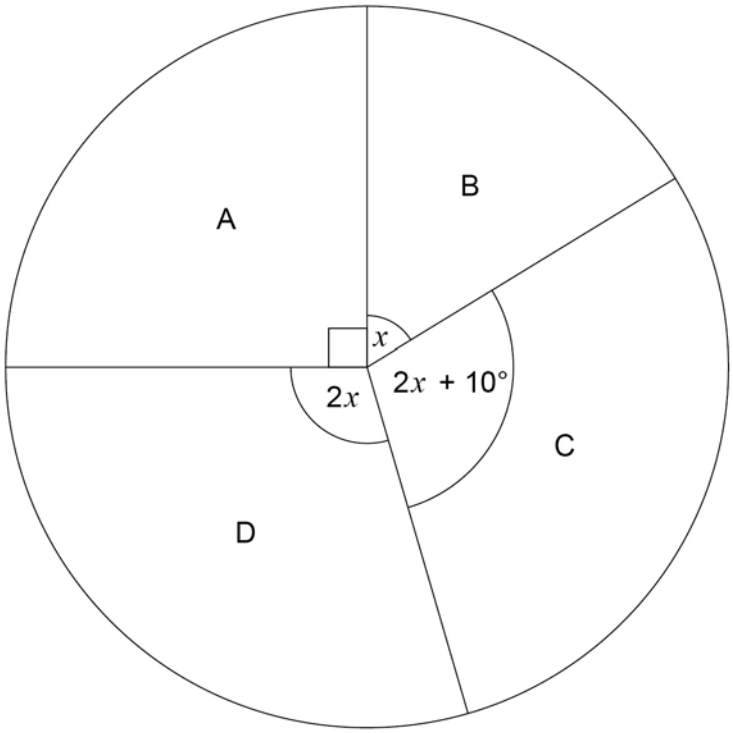
6

**30** The four candidates in an election were A, B, C and D.

The pie chart shows the proportion of votes for each candidate.

**Proportion of votes**

Not drawn accurately




Work out the probability that a person who voted, chosen at random, voted for C.

**[4 marks]**

Answer _____

**31 (a)** Factorise $x^2 - 100$

**[1 mark]**

Answer

**31 (b)** Solve $7x + 6 > 1 + 2x$

**[2 marks]**

Answer

**END OF QUESTIONS**

7

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