



Please write clearly in block capitals.

Centre number

Candidate number

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Tuesday 6 November 2018 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.
- Fill in the boxes at the top of this page.
- 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 graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

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	
TOTAL	

Advice

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



N 0 V 1 8 8 3 0 0 1 F 0 1

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Answer **all** questions in the spaces provided

1 Work out $(-3) + (-8)$
Circle your answer.

[1 mark]

-5

5

-11

11

2 What does the longest bar in a bar chart represent?
Circle your answer.

[1 mark]

mean

median

mode

range

3 Work out $1.1 - 0.15$
Circle your answer.

[1 mark]

$$\begin{array}{r} 1.10 \\ -0.15 \\ \hline 0.95 \end{array}$$

0.95

1.05

0.85

1.085



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4 On a circle, which of these is **always** longer than the diameter?
Circle your answer.

[1 mark]

chord

arc

radius

circumference

5 Work out 83×26

[3 marks]

$$\begin{array}{r}
 83 \\
 \times 26 \\
 \hline
 498 \\
 1660 \\
 \hline
 2158
 \end{array}$$

Answer _____

7

Turn over ►



Do not write outside the box

6 The cost of 3 calendars is £18
Work out the cost of 5 calendars.

$\div 3 \left\{ \begin{array}{l} 3 \text{ calendars} = \pounds 18 \\ 1 \text{ calendar} = \pounds 6 \end{array} \right. \downarrow \div 3$
 $\times 5 \left\{ \begin{array}{l} 5 \text{ calendars} = \pounds 30 \end{array} \right. \downarrow \times 5$ [2 marks]

Answer £ _____

7 A helicopter blade does 3206 full turns in 7 minutes.
Work out the number of full turns per minute.

[2 marks]

$$\begin{array}{r}
 0458 \\
 \hline
 7 \overline{) 3206}
 \end{array}$$

Answer _____



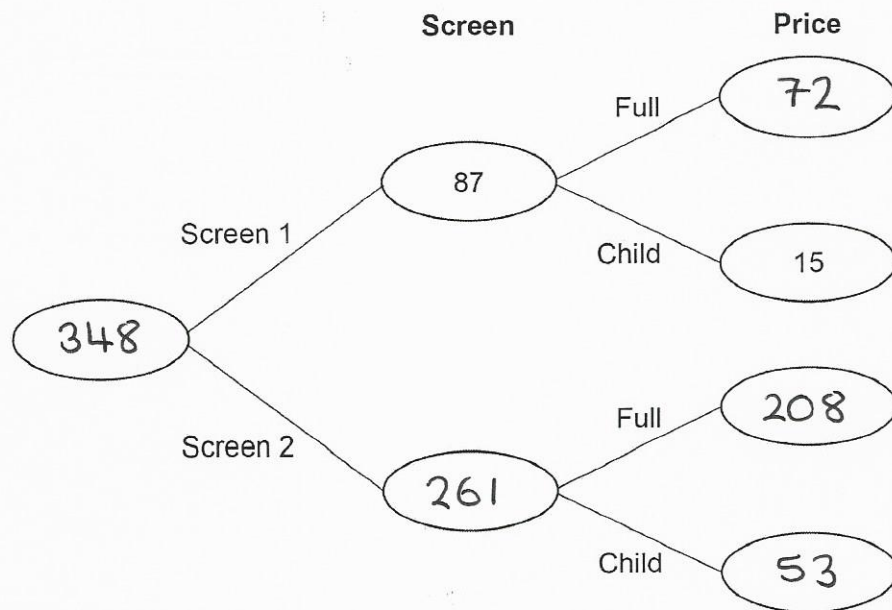
8

At a cinema, films are shown on Screen 1 and Screen 2
Customers pay full price or child price.

There are three times as many customers in Screen 2 as Screen 1
68 customers paid child price.

Complete the frequency tree.

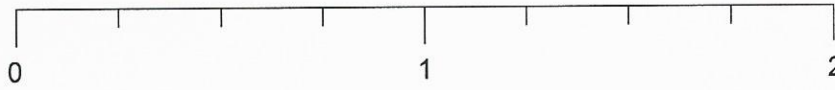
[5 marks]



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9

Work out the fraction that is halfway between $\frac{1}{2}$ and $1\frac{1}{4}$



[3 marks]

$$\begin{aligned} 1\frac{1}{4} &= \frac{5}{4} = \frac{10}{8} \\ \frac{1}{2} &= \frac{2}{4} = \frac{4}{8} \\ \frac{10}{8} + \frac{4}{8} &= \frac{14}{8} \\ \frac{14}{8} \div 2 &= \frac{7}{8} \end{aligned}$$

Answer _____

10

x is a positive integer.

$35 \div x$ is a positive integer.

Work out the four possible values of x .

[2 marks]

x must be a factor of 35.

Answer 1 5 7 35



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11 A fair dice has six sides, numbered 1 to 6
After it is rolled, five of the numbers can be seen.

11 (a) Write down the probability that one of these five numbers is 2 [1 mark]

Answer $\frac{5}{6}$

11 (b) Work out the **greatest** possible sum of the five numbers. [2 marks]

$2 + 3 + 4 + 5 + 6 = 20$

Answer _____

Turn over for the next question

8

Turn over ►



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12 Work out $\frac{2}{7} + \frac{6}{7} = \frac{8}{7}$

Circle your answer.

[1 mark]

$\frac{1}{7}$

$\frac{8}{14}$

$\frac{8}{49}$

$1\frac{5}{7}$

13 Work out $4 + 3 \times 5 - 1$

Circle your answer.

[1 mark]

$4 + 3 \times 5 - 1$

$4 + 15 - 1$ 16

18

28

34

$19 - 1$

18

14 The n th term of a sequence is $5n - 2$

Work out the 3rd term.

Circle your answer.

[1 mark]

51

5

123

13

$5(3) - 2$

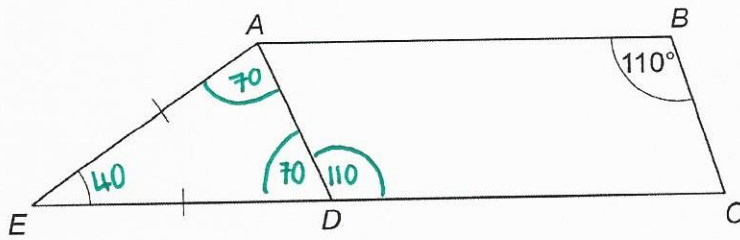
$15 - 2$



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15

Trapezium $ABCE$ is made from parallelogram $ABCD$ and isosceles triangle ADE .
 $AE = DE$



Not drawn accurately

Work out the size of angle AED .

[3 marks]

$\angle ADC$ is the same as $\angle ABC = 110^\circ$

$\angle EDA = 70^\circ$ ($180 - 110$)

$\triangle ADE$ is isosceles $\therefore \angle EAD = 70^\circ$

$\angle AED = 180 - (70 + 70) = 40^\circ$

Answer _____ degrees

16

$a : b = 1 : 6$

$a : c = 3 : 1$

How many times bigger is b than c ?

[2 marks]

$a : b : c$

(x3) $1 : 6$

$3 : : 1$

$\therefore b$ is 18 times bigger than c

$3 : 18 : 1$

Answer _____

Turn over ►



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17 (a) Laura wants to work out 3% of 1700

Her method is 1700×0.3

Is her method correct?

Tick a box.

Yes

No

Give a reason for your answer.

[1 mark]

Multiplying by 0.3 finds 30%

17 (b) Laura also wants to work out $\frac{30}{29}$ of 60

Her answer is 58

Is her answer correct?

Tick a box.

Yes

No

Give a reason for your answer.

[1 mark]

The fraction is top-heavy so the answer would be larger.



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18 Here are five shapes, A to E.

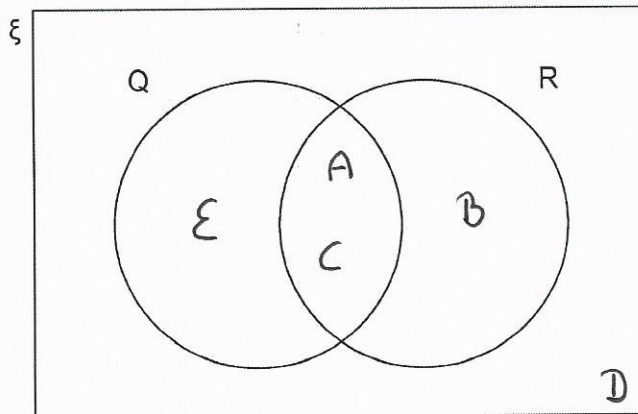
A	Parallelogram
B	Regular pentagon
C	Rhombus
D	Scalene triangle
E	Trapezium

In the Venn diagram,

ξ is the set of all shapes

Q is the set of quadrilaterals

R is the set of shapes which **always** have rotational symmetry.



Complete the Venn diagram with the letters A to E.

[3 marks]

5

Turn over ►



19

$a = 7$ and $b = 2$

Work out the value of $\frac{a}{b} - a^b$

[3 marks]

$$\frac{7}{2} - 7^2$$

$$3.5 - 49$$

$$= -45.5$$

Answer _____

20

Solve $3x - 8 = 19$

[2 marks]

$$3x - 8 = 19$$

$$+8 \quad +8$$

$$3x = 27$$

$$\div 3 \quad \div 3$$

$$x = 9$$

x = _____



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21 Here are five number cards.



Two of the five cards are picked at random.

Work out the probability that the total of the two numbers is more than 30

[3 marks]

	17	12	23	15	16
17		29	40	32	33
12	29		35	27	28
23	40	35		38	39
15	32	27	38		31
16	33	28	39	31	

Cannot pick the same card twice.

$$P(>30) = \frac{14}{20} = \frac{7}{10}$$

Answer _____

Turn over ►

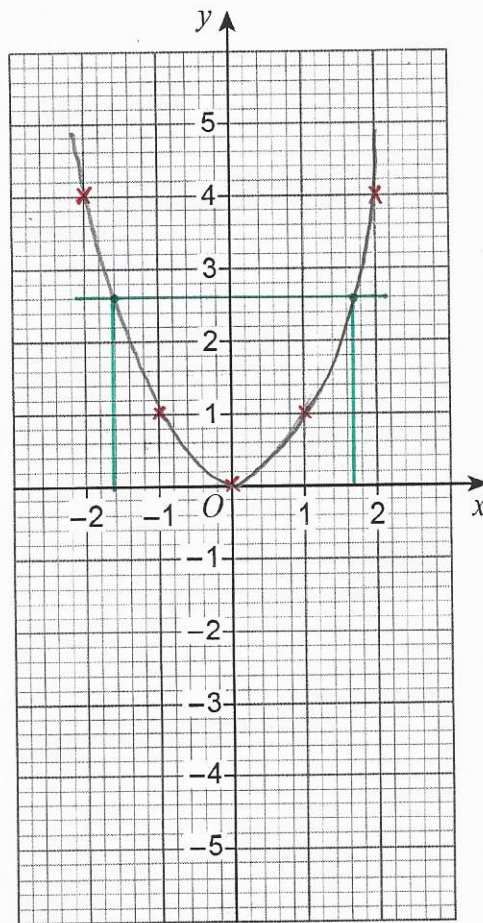


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22 (a) Complete the table of values for $y = x^2$ [1 mark]

x	-2	-1	0	1	2
y	4	1	0	1	4

22 (b) Draw the graph of $y = x^2$ for values of x from -2 to 2 [2 marks]



22 (c) Use your graph to estimate the value of $\sqrt{2.6}$ [2 marks]

Answer 1.6 and -1.6



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23 Two consecutive whole numbers are n and $n + 1$

23 (a) Simplify $n - (n + 1)$

[1 mark]

$$n - (n + 1) = n - n - 1$$

Answer -1

23 (b) Multiply out $n(n + 1)$

[1 mark]

Answer $n^2 + n$

23 (c) The two numbers are added.

Show that the answer must be an odd number.

[2 marks]

$$n + (n + 1) = 2n + 1$$

 $2n$ must be even as all multiples of 2 are

 $2n + 1$ must be odd as even + 1 = odd

9

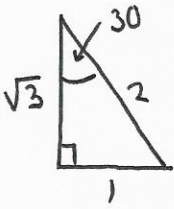
Turn over ►



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24 Circle the value of $\cos 30^\circ$

[1 mark]



$\frac{1}{2}$

$\frac{\sqrt{3}}{2}$

0

1

25

Work out $8\frac{1}{2} \div 2\frac{2}{3}$

Give your answer as a mixed number.

[4 marks]

$$8\frac{1}{2} \div 2\frac{2}{3}$$

$$\frac{17}{2} \div \frac{8}{3}$$

K S F

$$\frac{17}{2} \times \frac{3}{8} = \frac{51}{16}$$

$$= 3\frac{3}{16}$$

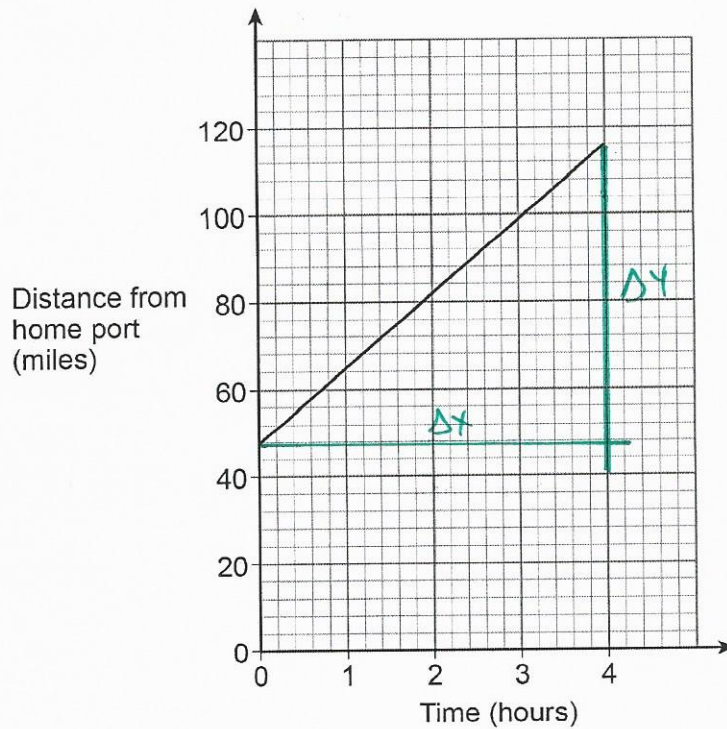
Answer _____



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26

A ship is sailing in a straight line from its home port.
The distance-time graph shows 4 hours of the journey.



Work out the speed of the ship during these 4 hours.

[3 marks]

Speed is given by the gradient of the line

$$\frac{\Delta y}{\Delta x} = \frac{116 - 48}{4 - 0} = \frac{68}{4} = 17 \text{ miles per hour}$$

Answer _____ mph

Turn over ►



27 Kim works at an airport in the UK.
 She records the number of planes landing between 10 am and 2 pm each day.
 The table shows the data for the first 10 days in January.

Day	1	2	3	4	5	6	7	8	9	10
Number of planes	148	151	147	155	153	147	155	102	151	154

27 (a) The airport was affected by fog on one of the days.
 Which day do you think it was?
 Give a reason for your answer.

[1 mark]

Day 8

Reason 102 is an outlier, all the others are in the range 147 → 155

27 (b) Kim uses the data to predict how many planes will land at the airport in a year.
 In her method, she
 uses an estimate of 150 planes in each 4-hour period throughout the day
 assumes the same number of planes each day.

Work out her prediction.

[3 marks]

$24 \div 4 = 6$

$150 \times 6 = 900$

$900 \times 365 = 328500$

$$\begin{array}{r} 365 \\ \times 9 \\ \hline 3285 \end{array}$$

Answer _____



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27 (c) In fact,
fewer planes land in winter than in summer
fewer planes land at night than during the day.

What does this tell you about Kim's prediction?

Tick **one** box.

Her prediction is too low

Her prediction is too high

Her prediction could be too low or too high

Give a reason for your answer.

[2 marks]

There is not enough information to decide.

Turn over for the next question

6

Turn over ►



28

The sum of the angles in any quadrilateral is 360°

For example, in a rectangle $4 \times 90^\circ = 360^\circ$

Zak writes,

$5 \times 90^\circ = 450^\circ$ so the sum of the angles in any pentagon must be 450°

Is he correct?

Tick a box.

Yes

No

Show working to support your answer.

[2 marks]

$$\begin{aligned} \text{Interior Angles} &= (\text{number of sides} - 2) \times 180 \\ &= (5 - 2) \times 180 \\ &= 3 \times 180 \\ &= 540^\circ \end{aligned}$$



29

$$\sqrt{6^2 + 8^2} = \sqrt[3]{125a^3}$$

Work out the value of a .

[4 marks]

$$\sqrt{6^2 + 8^2} = \sqrt[3]{125a^3}$$

$$\sqrt{36 + 64} = \sqrt[3]{125a^3}$$

$$\sqrt{100} = \sqrt[3]{125a^3}$$

$$10 = 5a$$

$$\div 5 \quad \div 5$$

$$2 = a$$

Answer _____

30

Work out the percentage increase from 80 to 280

[3 marks]

$$280 - 80 = 200$$

$$\frac{280}{80} \times 100 = 2.5 \times 100 = 250\%$$

Answer _____ %

Turn over for the next question

Turn over ►



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31

Solve $x^2 - x - 12 = 0$

[3 marks]

$$(x - 4)(x + 3) = 0$$

$$x - 4 = 0$$

$$+4 \quad +4$$

$$x = 4$$

$$x + 3 = 0$$

$$-3 \quad -3$$

$$x = -3$$

Answer _____

END OF QUESTIONS

3