AQA

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

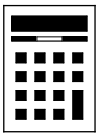
F

Foundation Tier Paper 2 Calculator

Monday 6 November 2017 Morning 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 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	
TOTAL	

Answer **all** questions in the spaces provided

1 How many minutes are there in $2\frac{1}{4}$ hours?

Circle your answer.

[1 mark]

135 145 215 225

2·25 x60

2 Which of these numbers is **half** of a square number?

Circle your answer.

[1 mark]

1 2 3 4

4÷2=2

3 Circle the value of the digit 3 in the number 17.03

[1 mark]

$\frac{3}{10}$ $\frac{1}{30}$ $\frac{3}{100}$ $\frac{1}{300}$

4 The value of A is double the value of B.

Circle the correct formula.

[1 mark]

$A = B + 2$ $A = 2B$ $A = \frac{B}{2}$ $A = B^2$

5 (a) Simplify $y \times y$

[1 mark]

Answer y^2

5 (b) Simplify $5a + 2 - a + 9$

[2 marks]

Answer $4a + 11$

Turn over for the next question

7

6 The table shows information about the birds in a garden.

Bird	Number
Robin	2
Sparrow	5
Wren	3
Lark	1

Draw a bar chart to show the information.

[3 marks]

7 Eve has these coins.

Ola has these coins.

Eve gives **three** of her coins to Ola.

Now, Ola has the same amount of money as Eve.

Which coins does Eve give to Ola?

[3 marks]

Eve: £3·97 total

Ola: £1·53 total

£2·44 diff → give £1·22

Answer £1 , 20p , 2p

Turn over for the next question

6

8 A dry cleaning shop has the following offers.

Suit

Normal price £12.50
1st suit normal price
2nd suit half price

Dress

Normal price £9.75
Three for the price of two

Work out the **total** price for 2 suits and 6 dresses.

[4 marks]

2 suits = 12·50 + ½(12·50)
= 18·75

6 dresses = 9·75 × 4
= 39·00

Total = 18·75 + 39·00
= 57·75

Answer £ 57·75

9 Karl has twin sisters.

The sum of the ages of Karl and his twin sisters is 39

In 4 years' time the twins will be 18

How old will Karl be in 4 years' time?

[3 marks]

18 - 4 = 14

14 x 2 = 28

39 - 28 = 11

so 11 + 4 = 15

Answer 15

Turn over for the next question

7

10 One of the angles in a triangle is 60°

Tick a box for each statement.

	Must be true	**Cannot be true**	**Might be true**
The triangle is equilateral			✓
The triangle has at least one other acute angle	✓		
The triangle is right-angled			✓
The other two angles are each less than 60°		✓	

[4 marks]

11 Which of these numbers has **exactly** two factors?

Circle your answer.

[1 mark]

6 7 8 9

12 Work out $\sqrt{7.5^2 + 18^2}$

Circle your answer.

[1 mark]

19.5 25.5 331.5 380.25

13 (a) Use your calculator to work out the exact value of $\frac{18\,953 \times 437}{11}$

[1 mark]

Answer 752 951

13 (b) Use approximations to 1 significant figure to check if your answer to part (a) is sensible.

[3 marks]

$\frac{20\,000 \times 400}{10} = 800000$ Yes

10

14 Chris sells lawnmowers.

The table shows the number he sold each quarter for three years.

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
2016	17	64	50	5	136
2015	9	72	61	1	143
2014	19	58	53	2	132

14 (a) In which year did he sell the most lawnmowers?

You **must** show your working.

[2 marks]

2015 with 143 sold

Answer 2015

14 (b) He uses the table to decide the number of lawnmowers to stock each quarter.

At the **start** of which quarter should Chris stock the most lawnmowers?
Circle your answer.

[1 mark]

Quarter 1 Quarter 2 Quarter 3 Quarter 4

15 In a test,

Section A has 80 marks

Section B has 120 marks.

Riya scores

55% in Section A

70% in Section B.

To pass, Riya needs to score 65% of the **total** marks.

Does she pass?

You **must** show your working.

[4 marks]

$0.55 \times 80 = 44$

$0.7 \times 120 = 84$

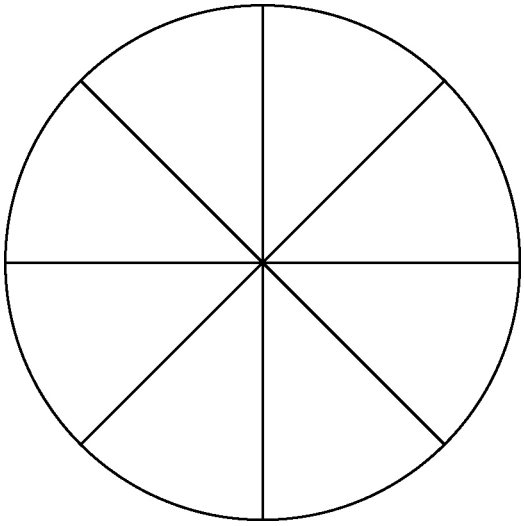
$44 + 84 = 128$ marks

$\frac{128}{200} \times 100 = 64\%$

Answer no she does not pass (64%)

7

16 A wheel is made of a circular rim and 8 spokes as shown.



Not drawn accurately

The length of each spoke is 37 cm

Work out the **total** length of the rim and spokes.

[3 marks]

Circumference $= 2 \times 37 \times \pi$

$= 74\pi$

Spokes $= 37 \times 8$

$= 296$

Total $= 296 + 74\pi \approx$

Answer 528.48 cm

17 Here is a formula to convert degrees Celsius (°C) to degrees Fahrenheit (°F).

$$F = 1.8C + 32$$

F is the number of degrees Fahrenheit

C is the number of degrees Celsius

17 (a) Show that –40°C = –40°F

[2 marks]

$F = 1.8 \times (-40) + 32$

$= -72 + 32 = -40°F$

so $-40°C = -40°F$

17 (b) The temperature is –15°C

Nick says,

"Because the temperature is negative in Celsius, it **must** be negative in Fahrenheit."

Is he correct?

You **must** show your working.

[1 mark]

No: $F = (1.8 \times -15) + 32$

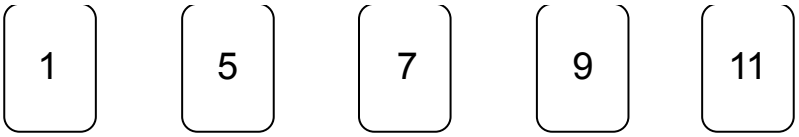
$= -27 + 32 = 5°F$

positive

Answer No

6

18 Here are five cards.



One of the cards is removed.

The mean of the numbers on the remaining four cards is 6

Which card was removed?

You **must** show your working.

[3 marks]

$6 \times 4 = 24$ total

$1+5+7+9+11 = 33$

$33 - 24 = 9$

Answer 9

19 (a) Divide 120 in the ratio 1 : 4

[2 marks]

Total parts = 5

120 ÷ 5 = 24 (1 part)

24 × 4 = 96 (4 parts)

Answer 24 : 96

19 (b) Write the ratio 7 : 4 in the form n : 1

[1 mark]

7/4 : 1

Answer 1·75 : 1

Turn over for the next question

6

20 In 2015, Han was paid £1350 per month.

In 2016, he

had a 2% increase in his monthly pay

worked 37.5 hours per week

worked for 47 weeks.

Work out Han's average pay **per hour** for 2016

[5 marks]

$1350 \times 1.02 = 1377$ per month 2016

$1377 \times 12 = 16\,524$ per year

$47 \times 37.5 = 1762.5$ hrs

$\frac{16524}{1762.5} \approx 9.38$

Answer £ 9.38

21 An experiment is carried out 200 times.

The possible outcomes are K, L and M.

21 (a) Complete the table.

[2 marks]

Outcome	K	L	M
Frequency	84	54	62
Relative frequency	0.42	0·27	0·31

21 (b) Altogether, the experiment is carried out 500 times.

How many times would you expect the outcome to be K?

[2 marks]

500 x 0·42 = 210

Answer 210

Turn over for the next question

9

22 The table shows information about the UK and Germany.

	Population	**Area (square miles)**
UK	64 000 000	95 000
Germany	82 000 000	140 000

Population density = $\frac{\text{population}}{\text{area}}$

Compare the population densities of the UK and Germany.

[3 marks]

UK: $\frac{64\,000\,000}{95\,000} \approx 674$

UK greater

G: $\frac{82\,000\,000}{140\,000} \approx 586$

23 Which **one** of the following is discrete data?

Circle your answer.

[1 mark]

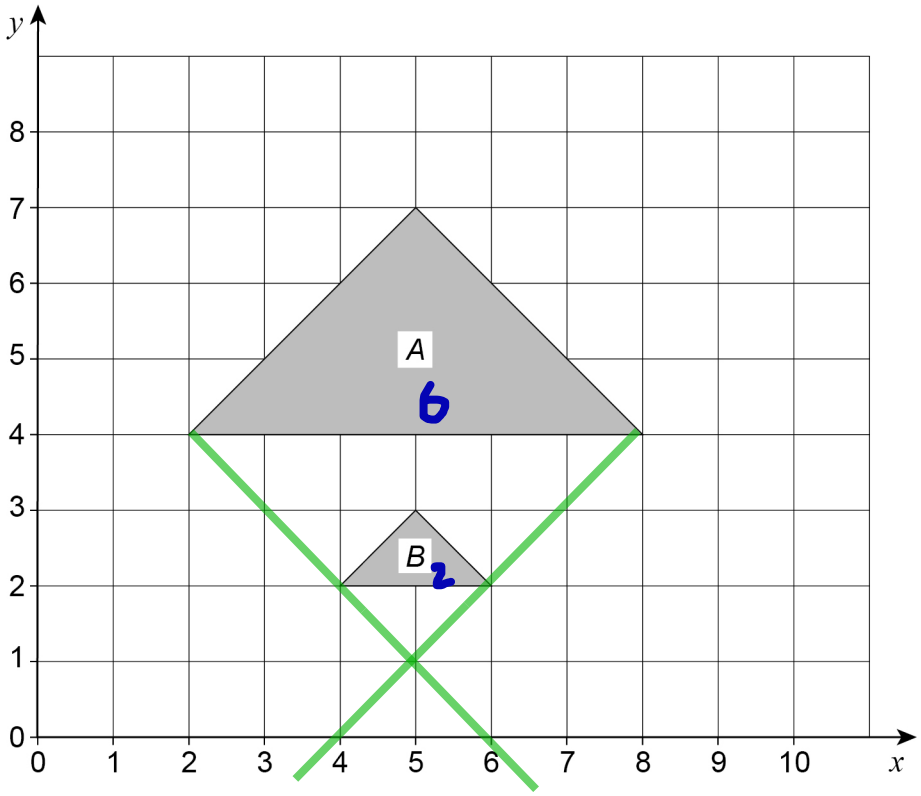
Mass of a television

Time taken to deliver a television

Height of a television mast

Number of televisions sold

24 Describe fully the **single** transformation that maps triangle *A* to triangle *B*.



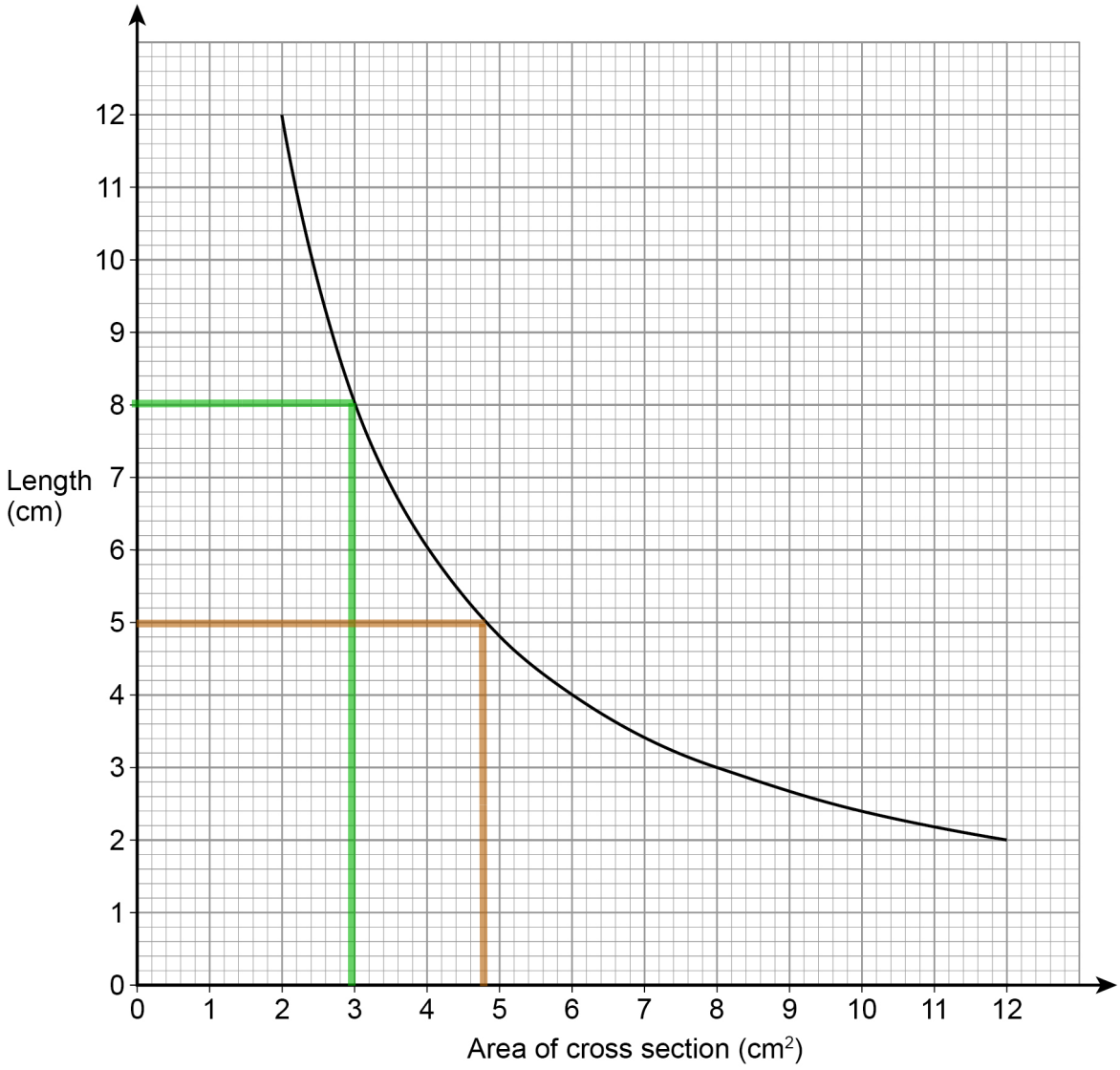
[3 marks]

Enlargement sf $\times\frac{1}{3}$ centre (5, 1)

Turn over for the next question

7

25 The graph shows information about prisms with the same volume.



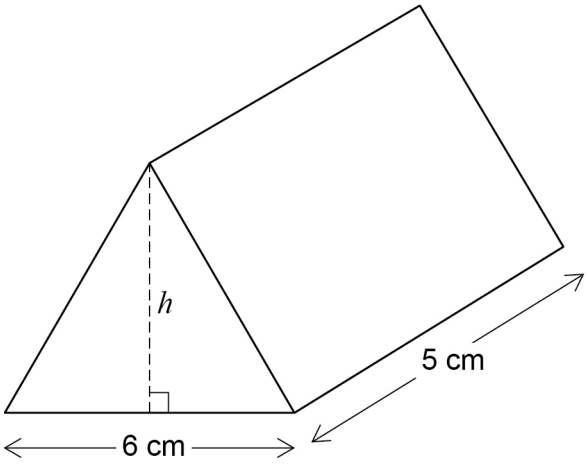
25 (a) Give **one** example to show the volume is 24 cm^3

[1 mark]

$3 \times 8 = 24\ cm^3$

25 (b) The diagram shows a prism with volume 24 cm^3

The height of the triangular cross section is h.



Work out the height, h.

[3 marks]

CSA = $4.8 cm^2$

$\frac{1}{2} \times 6 \times h = 4.8$

$h = 4.8 \div 3 = 1.6$

Answer 1.6 cm

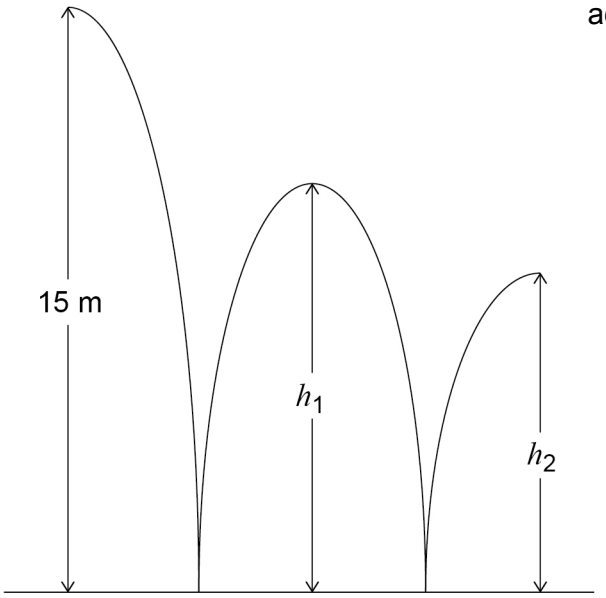
Turn over for the next question

4

26 A ball is thrown from a height of 15 metres.

It bounces to height h_1, then to height h_2 as shown.

Not drawn accurately



h_1 is three quarters of the original height.

26 (a) Jack expects h_2 to be three quarters of h_1

Work out the value of h_2 that he expects.

[2 marks]

$\frac{3}{4} \times \frac{3}{4} \times 15 = \frac{9}{16} \times 15 = 8.4375$

Answer 8.4375 metres

26 (b) In fact, h_2 is two thirds of h_1

How does this affect the answer to part (a)?

Tick a box.

☐ The ball bounced higher than he expected

☑ The ball bounced lower than he expected

Show working to support your answer.

[2 marks]

$\frac{3}{4} \times \frac{2}{3} \times 15 = 7.5\text{cm} < 8.4$

Turn over for the next question

4

27 Solve $4(3x - 2) = 2x - 5$

[3 marks]

$12x - 8 = 2x - 5$

$12x = 2x + 3$ $(+8)$

$10x = 3$ $(-2x)$

$x = 0.3$ $(\div 10)$

$x =$ 0.3

28 Work out the next term of this quadratic sequence.

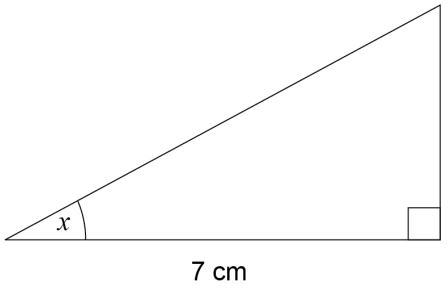
[2 marks]

5 $\xrightarrow{+3}$ 8 $\xrightarrow{+6}$ 14 $\xrightarrow{+9}$ 23 $\xrightarrow{+12}$ 35 .....

Answer 35

29 Work out the size of angle x.

Not drawn accurately



[2 marks]

SOH CAH TOA

$\tan x = \frac{3}{7}$

$x \approx 23.2$

Answer 23.2 degrees

END OF QUESTIONS

7

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED