MODEL SOLUTIONS

AQA

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

F

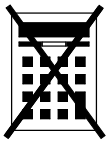
Foundation Tier Paper 1 Non-Calculator

Tuesday 19 May 2020 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.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- 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.

Do not write outside the box

1 Here are some numbers.

5	5	8	13	14	15	17

Circle the range.

[1 mark]

5 11 (12) 13

Range = Highest Number − Lowest Number

Range = 17 − 5 = 12

2 Circle the value of the digit 5 in 256 934

[1 mark]

5000 500 000 50 (50 000)

3 Work out −2 − 5

Circle your answer.

[1 mark]

(−7) −3 3 7

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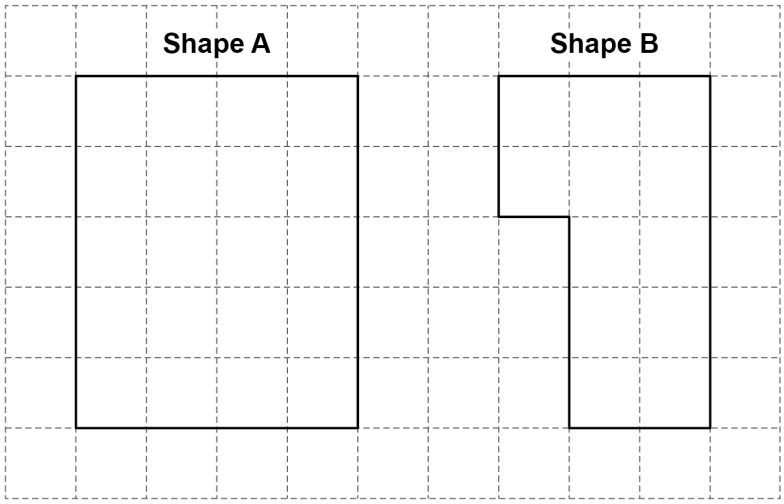
4 What is 680 millimetres in centimetres?

Circle your answer.

[1 mark]

0.68 cm 6.8 cm 68 cm 6800 cm

5



Work out area of Shape A : area of Shape B

Give your answer in its simplest form.

[2 marks]

Area of A = 20 squares

Area of B = 12 squares

A : B

20 : 12

10 : 6

5 : 3

Answer 5 : 3

6

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6 (a) Samir and Dan run a race.

Samir finishes in $2\frac{1}{2}$ minutes.

Dan finishes in 130 seconds.

Complete the following sentence.

[2 marks]

Dan wins by 20 seconds.

Samir: 2½ mins = 150 seconds

150 − 130 = 20 seconds

6 (b) Alice does a sponsored walk.

She starts from home on Monday at 8 am

She arrives back home 55 hours later.

Work out when she arrives back home.

[2 marks]

55 hours = 2 days + 7 hours

Monday + 2 days = Wednesday

8 am + 7 hours = 15:00 = 3 pm

Day Wednesday

Time 3 pm

Do not write outside the box

7 Work out $(43 \times 8) - (234 \div 6)$

[3 marks]

(B) I D M A S

Brackets First

$43 \times 8 = 344$

$234 \div 6 = 39$

$344 - 39 = 305$

$^{2}43 \times 8 = 344$

$6 \overline{)23^{5}4} \quad 39$

Answer 305

Turn over for the next question

7

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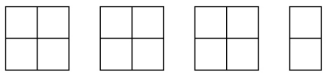
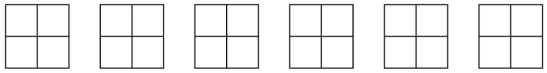
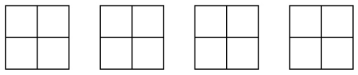
8 Here is some information, by ticket type, about the number of people visiting a cinema one week.

Key:  represents 40 people

Adults	
Students	
Children	

8 (a) How many children visited the cinema?

[1 mark]

4 big squares = 4 × 40 = 160

Answer 160 children

8 (b) How many **more** students than adults visited the cinema?

[2 marks]

Adults: 3.5 big squares: 3.5 × 40 = 140

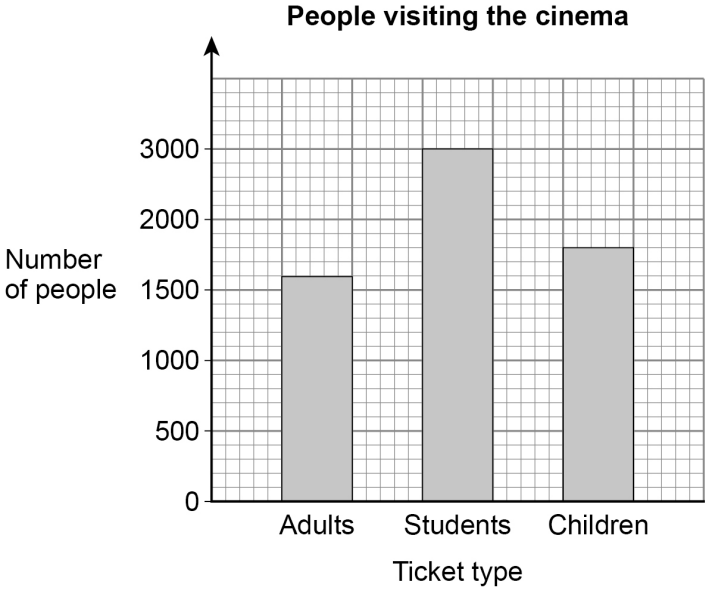
Students: 6 big squares: 6 × 40 = 240 240 - 140 = 100

Answer 100

Do not write outside the box

8 (c) A bar chart is drawn to show the number of people visiting the cinema one month.

Ticket type	Number of people
Adults	1600
Students	3000
Children	1800



Give **one** criticism of the bar chart.

[1 mark]

The vertical increments are 500 per large box except between 2000 & 3000 where it's 1000.

4

Turn over ►

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9 Harry will pay income tax if he earns more than £12 500 in a year.

After 8 months he has earned a **total** of £7600

For the rest of the year he earns £1200 each month.

Will he pay income tax?

You **must** show your working.

[3 marks]

12 months − 8 months = 4 months

4 × 1200 = 4800

7600 + 4800 = £12,400

£12,400 is less than £12,500 so he will not pay income tax.

10 x is a 2-digit whole number.

How many digits does the number $10x$ have?

Circle your answer.

[1 mark]

cannot tell 2 (3) 4

A 2 digit number gets 'shifted' by one place value, so becomes a three digit number.

Do not write outside the box

11 (a) Circle the answer to 50×0.2

[1 mark]

1 (10) 100 1000

11 (b) Work out $3.65 \div 5$

Give your answer as a decimal.

[2 marks]

$$5\overline{)3.65} = 0.73$$

Answer 0.73

Turn over for the next question

7

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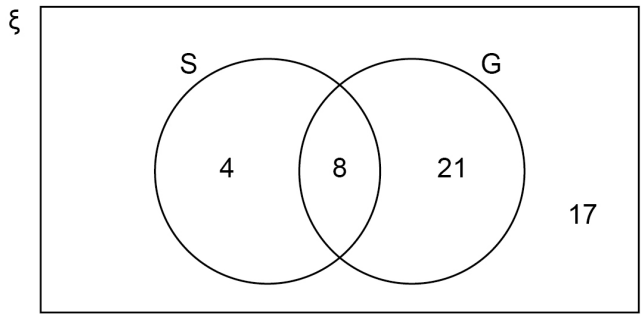
12 The Venn diagram shows information about 50 people who are in bands.

S = singers G = guitar players



12 (a) How many of the people are guitar players?

[1 mark]

$21 + 8 = 29$

Answer 29

12 (b) How many of the people are singers but **not** guitar players?

[1 mark]

Answer 4

12 (c) One of the people is chosen at random.

Write down the probability that the person is

not a singer

and

not a guitar player.

[1 mark]

Answer $\frac{17}{50}$

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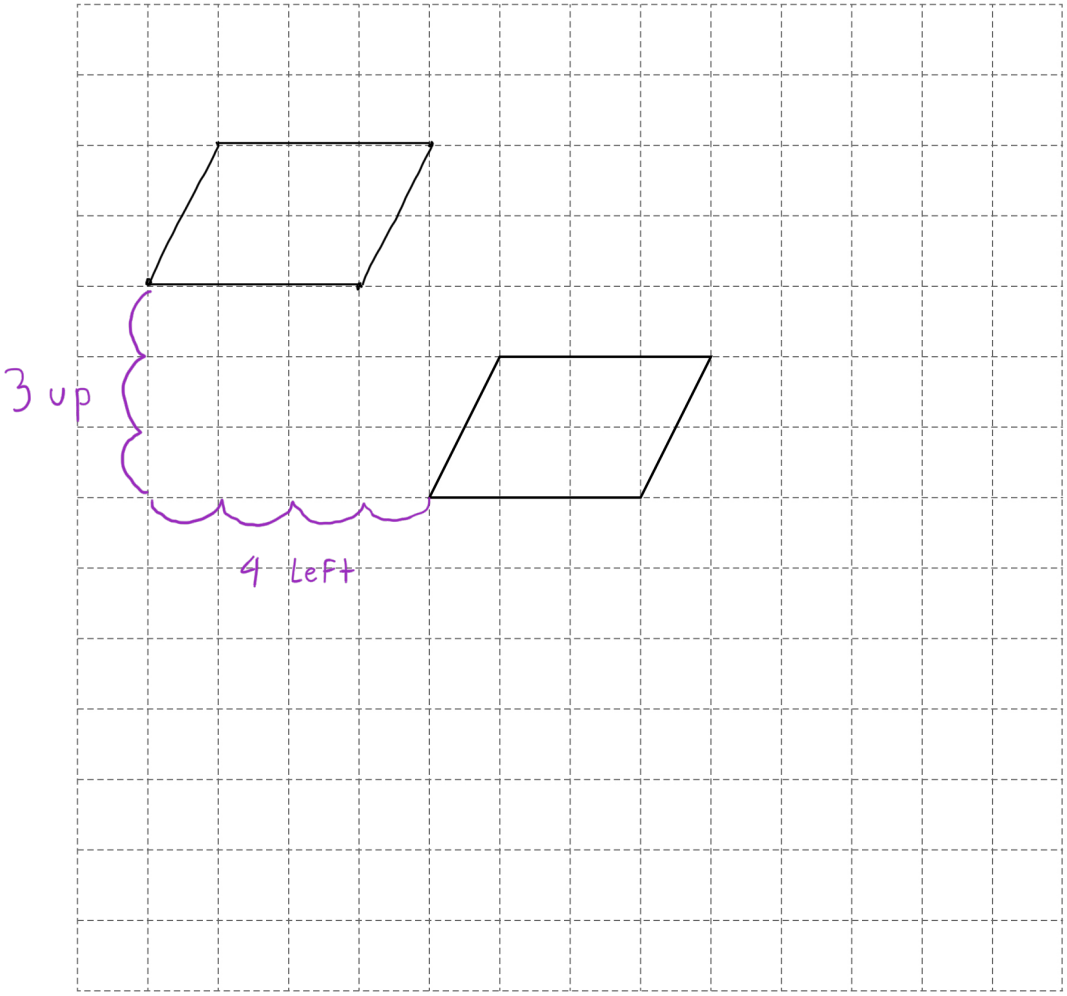
13 Here is a parallelogram.



The parallelogram is translated 4 squares to the left and 3 squares up.

Draw the translated parallelogram.

[2 marks]

5

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14 (a) Solve $6x - 11 = 13$

[2 marks]

$6x - 11 = 13$

$+11$ $+11$

$6x = 24$

$\div 6$ $\div 6$

$x = 4$

$x =$ 4

14 (b) Simplify fully $(2 \times 4a) + 9 + \frac{15a}{3} - 7$

[3 marks]

$2 \times 4a = 8a$

$\frac{15a}{3} = 5a$

$8a + 9 + 5a - 7$

$= 13a + 2$

Answer $13a + 2$

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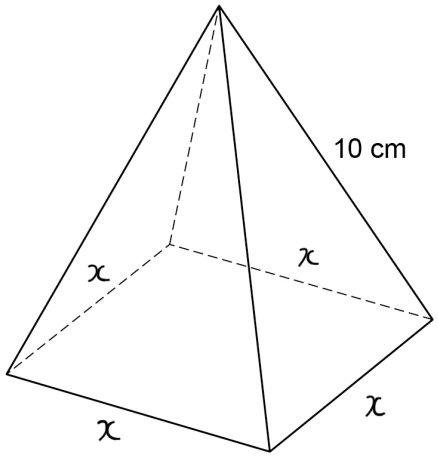
15 A pyramid has a square base.

Each of the four sloping edges has length 10 cm



The total length of all eight edges is 68 cm

Work out the **area** of the square base.

[4 marks]

$10 + 10 + 10 + 10 + x + x + x + x = 68$

simplify

$40 + 4x = 68$

-40 -40

$4x = 28$

$\div 4$ $\div 4$

$x = 7$

Area of a square = base x height

$= 7 \times 7 = 49$

Answer 49 cm^2

9

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16 The table shows information about how 150 students travel to school.

	Walk	**Bus**	**Car**	
Girls	22	33	17	Total = 72
Boys	24	41	13	Total = 78

16 (a) What fraction of the **girls** walk to school?

Give your answer in its simplest form.

[2 marks]

$\frac{22}{72} = \frac{11}{36}$

Answer $\frac{11}{36}$

16 (b) One of the **boys** is chosen at random.

What is the probability that the boy travels to school by bus?

[1 mark]

$\frac{41}{78}$ ← No. of boys that take the bus / ← Total no. of boys

Answer $\frac{41}{78}$

Do not write outside the box

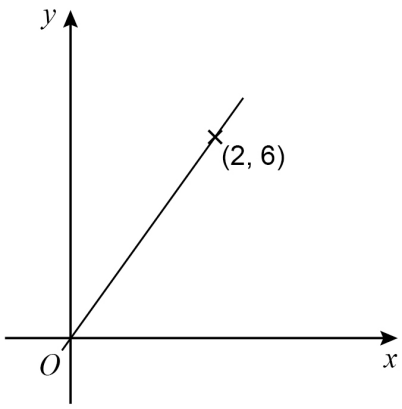
16 (c) What percentage of the 150 **students** travel to school by car?

[2 marks]

$17 + 13 = 30$ $\quad \frac{30}{150} = \frac{3}{15} = \frac{1}{5} = 20\%$

Answer 20 %

17 A straight line passes through O and (2, 6)



Circle the equation of the line.

[1 mark]

$y = x + 4$ $\quad y = 6$ $\quad (y = 3x)$ $\quad y = \frac{1}{3}x$

$y \div x = 6 \div 2 = 3$ (gradient)

6

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18 (a) Work out 110% of 80

[2 marks]

110% = 1.1 (As a decimal number)

1.1 × 80 = 88

Answer 88

18 (b) Work out 21 as a fraction of 12

Circle your answer.

[1 mark]

(7/4) 4/7 3/4 4/3

$\frac{21}{12} = \frac{7 \times 3}{4 \times 3} = \frac{7}{4}$

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19 Bags X and Y each contain counters.

Bag X	**Bag Y**
30 counters	5 counters
Each counter is green, white or yellow	3 green and 2 red

19 (a) P(green counter from X) = P(red counter from Y)

Work out the number of green counters in X.

[2 marks]

$2 \times \frac{30}{5} = 12$

Answer 12

19 (b) All 35 counters are put into one bag.

One counter is picked at random.

Work out the probability that the counter is **not** red.

[2 marks]

Non-red counters = $30 + 3 = 33$

P(Not red) = $\frac{33}{35}$

Answer $\frac{33}{35}$

7

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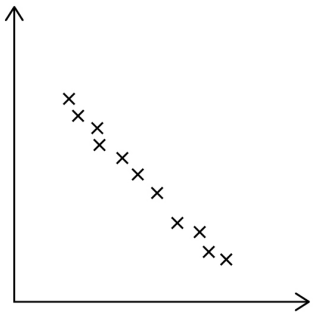
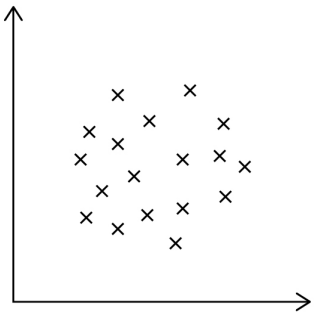
20 A and B are scatter graphs.

Graph A



Graph B



What type of correlation is shown by each graph?

Choose from

Weak positive
Strong positive
Weak negative
Strong negative
No correlation

[2 marks]

Graph A Strong negative

Graph B No correlation

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21 (a) All the terms of a **geometric** progression are positive.
The second and fourth terms are shown.

..... 4 16

Work out the first and third terms.

[2 marks]

geometric progression: 2, 4, 8, 16 (×2 ×2 ×2)

First term 2

Third term 8

21 (b) The first two terms of an **arithmetic** progression are shown.

p $5p$ .....

The sum of the first three terms is 90

Work out the value of p.

[3 marks]

common difference = $+4p$

Third term = $5p + 4p = 9p$

$p + 5p + 9p = 15p$ $\quad 15p = 90$

$p = 6$

Answer $p = 6$

7

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22 This formula converts temperature in degrees Fahrenheit (F) to kelvin (K)

$$K = \frac{5}{9}(F - 32) + 273$$

A pottery oven is heated to 2192 degrees Fahrenheit.

Work out this temperature in kelvin.

[3 marks]

$F = 2192$ $K = \frac{5}{9}(2192 - 32) + 273$

$K = \frac{5}{9}(2160) + 273$

$K = 1200 + 273$

$K = 1473$ Kelvin

Answer 1473 kelvin

23 As a decimal $\frac{11}{40} = 0.275$

Work out $\frac{33}{400}$ as a decimal.

[2 marks]

$\frac{11}{40} = 0.275$

$\div 10$ $\div 10$

$\frac{11}{400} = 0.0275$ $\times 3$

$\frac{33}{400} = 0.0825$

Answer 0.0825

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24 The cost of a holiday is £2400

Rana pays a deposit followed by monthly payments, in the ratio

deposit : total of the monthly payments = 3 : 5

She makes 6 equal monthly payments.

Work out her monthly payment.

[4 marks]

3 + 5 = 8

2400 ÷ 8 = £300

Total of Monthly payments = 300 × 5 = £1500

Monthly payment = 1500 ÷ 6 = £250

Answer £ 250

25 Factorise fully $2x^2 + 6x$

[2 marks]

Both 2 and x go into $2x^2$ and $6x$.

$2x^2 + 6x$

$= 2x(x + 3)$

Answer $2x(x + 3)$

11

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26 Two wire shapes make an earring.

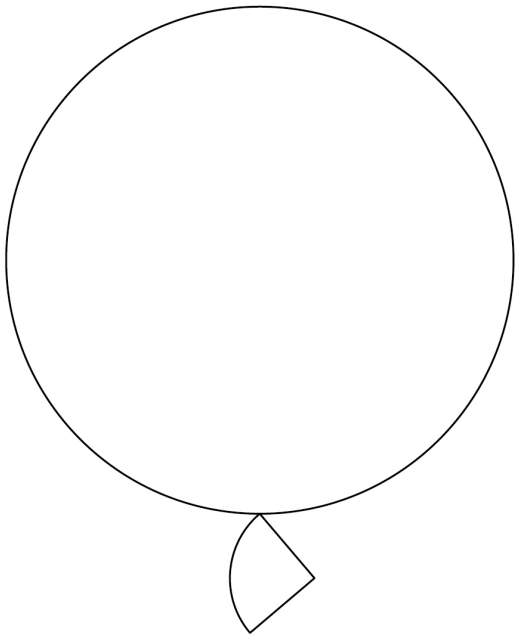
The shapes are

a circle with radius 21 mm

and

a quarter circle.

Not drawn accurately



radius of circle : radius of quarter circle = 7 : 2

26 (a) Show that the radius of the quarter circle is 6 mm

[1 mark]

×3 (7 : 2) ×3

21 mm : 6 mm

Do not write outside the box

26 (b) Work out the **total** length of the wire in the earring.

Give your answer in the form $a\pi + b$ where a and b are integers.

[4 marks]

Large circle circumference: $2\pi r = \pi d = 42\pi$ mm

Perimeter of quarter circle: $6 + 6 + \frac{2\pi \times 6}{4} = 12 + 3\pi$

$12 + 3\pi + 42\pi = 12 + 45\pi$ mm

Answer $12 + 45\pi$ mm

Turn over for the next question

5

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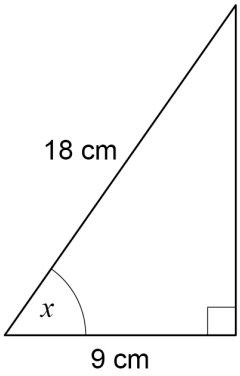
27 Use trigonometry to work out the size of angle x.



Not drawn accurately

[2 marks]

$\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$

$\cos x = \frac{9}{18}$

$x = 60°$

Answer 60 degrees

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28 Rearrange $c = \frac{d+2}{3}$ to make d the subject.

[2 marks]

$c = \frac{d+2}{3}$

$\times 3$ ↓ $3c = d+2$ ↓ $\times 3$

-2 ↓ $d = 3c-2$ ↓ -2

Answer $d = 3c - 2$

29 (a) Write 360 000 in standard form.

[1 mark]

$360\,000 = 3.6 \times 10^5$

Answer 3.6×10^5

29 (b) Write 9.2×10^{-3} as an ordinary number.

[1 mark]

0.0092

Answer 0.0092

END OF QUESTIONS

6

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ANSWER IN THE SPACES PROVIDED

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