AQA

GCSE
MATHEMATICS

F

Foundation Tier   Paper 1 Non-Calculator

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	
26	
TOTAL	

8300/1F

Answer **all** questions in the spaces provided.

1   Circle the answer to 0.02×100

[1 mark]

0.02 × 100 = 2

     0.2   **(2)**   20   200

2   Circle the expression that is equal to $x + x + x - x + x$

3x + x − x   4x − x = 3x

[1 mark]

     x $2x$ **($3x$)** $4x$

3   What is 260 millimetres in centimetres?

Circle your answer.

[1 mark]

     0.26 cm   2.6 cm   **(26 cm)**   2600 cm

1 cm = 10 mm

? = 260 mm

$$\frac{260 \times 1}{10} = 26\,cm$$

4   Which shape **can** have sides with lengths that are all different?

Circle your answer.

[1 mark]

trapezium   kite   parallelogram   rhombus

5   Work out $(-8) \times 5$

$-8 \times 5 = -40$

[1 mark]

$-x + = -$

Answer _____ -40 _____

Turn over for the next question

5

Turn over ▶

6   Luke buys 4 apples and 5 bananas.

The total cost is £3.70

Each apple costs 35p

Work out the cost in pence of each banana.

[4 marks]

4 apples + 5 bananas = £3·70

1 apple = 35p.

4 apples = ?.

$$3$$
$$\times\ 4$$
$$\overline{140}$$

$$35 \times 4 = 140p$$
$$\overline{1}$$

1£ = 100p

£3·70 = ?.

3·70 × 100

= 370p

Total Cost of Bananas

= 370p − 140p

= 230p
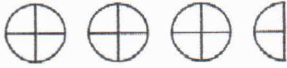
Cost of 1 banana

$$= \frac{230}{5}$$

$$\begin{array}{r} 46 \\ 5\overline{)230} \\ \underline{20} \\ 30 \\ \underline{-30} \\ 0 \end{array}$$

= 46p

Answer   **46**   pence
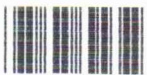
7 Rashid counted the pieces of homework he had done in three subjects.

He draws a pictogram to show the results.

Key: ⊕ represents 4 pieces of homework

Maths	⊕ ⊕ ⊕ ⊕ ⊕
English	⊕ ⊕ ⊕ ◖
Geography	⊕ ◗

7 (a) Rashid had done 5 pieces of Geography homework.

Show this information on the pictogram.

[1 mark]

7 (b) Rashid spent 30 minutes on each piece of homework.

Work out the **total** time he spent on homework for these three subjects.

Give your answer in hours and minutes.

[3 marks]

1 Piece of homework = 30 minutes

Total pieces of homework — Full circles = 9 × 4

1 Piece → 30 mins = 36 + 3

39 pieces — ?   1 hour = 60 mins = 39

$$\times \frac{39\ 0}{3}$$

11 7 0 minutes

?. = 1170 mins = $\frac{1170}{60}$

$$6\overline{)117}$$ = 19hrs 30mins

Answer _____19_____ hours _____30_____ minutes

Turn over ▶

8

8   A travel company is taking some passengers on a trip.

They can use coaches or minibuses.

Each coach can carry 53 passengers.

Each minibus can carry 12 passengers.

The passengers going on the trip would exactly fill 3 coaches.

If the company uses only minibuses, how many will they need?

[4 marks]

Each Coach = 53 Passengers

Each Minibus = 12 passengers

Passengers who Use Coaches = 53 × 3

$$= 159$$

If they use Minibuses:

1 Minibus = 12 Passengers

?. = 159 Passengers

$$\frac{159 \times 1}{12} = \frac{159}{12}$$

$$\begin{array}{r} 13 \\ 12\overline{\smash{)}159} \\ \underline{12} \\ 39 \\ \underline{36} \\ 3 \end{array}$$
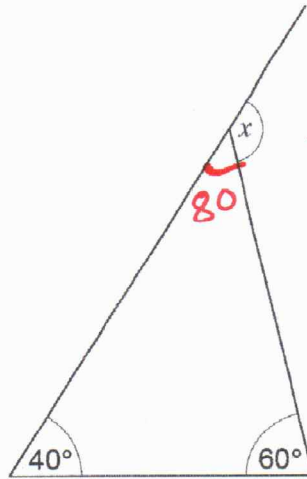
$$= 13\frac{3}{12}$$

$$\simeq 14 \text{ minibuses}$$

They would need 14 Minibuses

Answer ___14___

9 One side of a triangle is extended.

Not drawn
accurately

*Angles in straight
Line add up to 180°*

$x + 80° = 180$

$x = 180 - 80$

$x = \underline{100°}$

Circle the size of angle x.

[1 mark]

100° 80° 60° 40°

10 Pavel uses his calculator to work out 352 × 7268

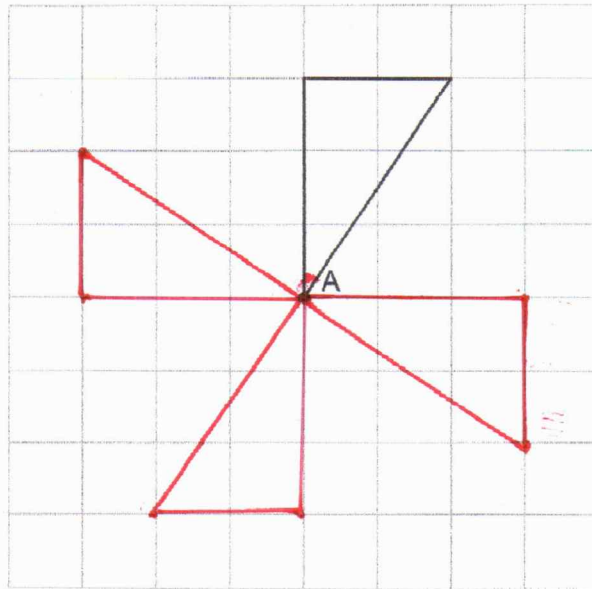Circle the **last** digit in the answer.

$2 \times 8 = 16$

[1 mark]

0 2 6 8

Turn over for the next question

6

Turn over ▶

11 Complete the diagram so that it has

rotational symmetry of order 4

centre of rotation at point A.

[2 marks]

12   10% of 2100 is 210

Work out 43% of 2100

[3 marks]

43% $\cancel{7}$ 2100

$\dfrac{43 \times 2100}{100}$

$\begin{array}{r} 43 \\ \times\ 21 \\ \hline 43 \\ 860 \\ \hline 903 \end{array}$ $= \underline{903}$

Answer _____ **903** _____

Turn over for the next question

5

Turn over ▶

IB/M/Jun21/8300/1F

13   Katy records the number of cars using a drive-through each hour for 24 hours.

Here are the results.

36	20	37	53	42	41	24	18	39	35	40	47
38	17	23	18	13	35	10	7	6	18	31	57

Katy makes this tally and frequency chart to put the data into groups.

Number of cars	Tally	Frequency
0 to 10	///	3
10 to 20	/////	5
20 to 30	///	3
30 to 40	///////	7
40 to 50	////	4

Make **two** criticisms of Katy's tally and frequency chart.

You do **not** need to complete the chart.

[2 marks]

Criticism 1   In the data sampled, there are some numbers missing in the categories for example 53 and 57.

Criticism 2   The categories are overlapping for example 0 to 10 should be 0 to 9, and 10 to 20 should be 10-19.

14   Counters in a bag are red, white or blue.

A counter is picked at random.

Complete the table.

[2 marks]

	Red	White	Blue
Probability	0.15	0.4	

Total Probabilties of all events = 1.

$P(Blue) = 1 - (0.15 + 0.4)$

$= 1 - 0.55$

$= 0.45$

Turn over for the next question

4

Turn over ▶

1 1

15 Here is a calculation.

$$31 \times 84 = 2604$$

You can use the calculation to help answer the following questions.

15 (a) Work out $2604 \div 84$

[1 mark]

Answer _____31_____

15 (b) Work out 3.1×8.4 $= 26.04$

$31 \times 84 = 2604$

[1 mark]

Answer _____26.04_____

15 (c) Work out 31×85

[2 marks]

$$31 \times 85 = (31 \times 84) + 31$$
$$= 2604 + 31$$
$$= 2635$$

$$\begin{array}{r} 2604 \\ + 31 \\ \hline 2635 \end{array}$$

Answer _____2635_____

16 A password has 30 characters.

It is made up of 5 numbers, 15 letters and some symbols.

Work out the ratio   numbers : letters : symbols

Give your answer in its simplest form.

Symbols = 30 − (5 + 15)
= 10

[2 marks]

5 numbers : 15 letters : 10 symbols.

$$\frac{5}{5} : \frac{15}{5} : \frac{10}{5} = 1 : 3 : 2$$

Answer ___1___ : ___3___ : ___2___

17 Work out $\dfrac{5}{6} + \dfrac{7}{12}$

Give your answer as a mixed number.

[3 marks]

$$\frac{5}{6} + \frac{7}{12}$$ obtain L.C.M

$$\frac{10 + 7}{12} = \frac{17}{12}$$

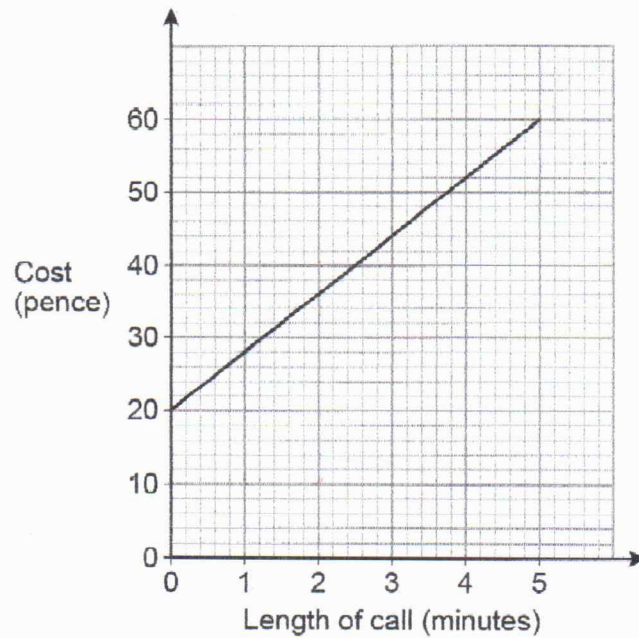$$12\,\overline{)17}$$
$$\underline{-12}$$
$$5 \qquad = 1\frac{5}{12}$$

Answer $1\frac{5}{12}$

9

Turn over ▶

18   The cost of making a phone call is

        a fixed charge

        and

        a charge per minute.

The costs of phone calls up to 5 minutes are represented by the graph.

18 (a)   Write down the fixed charge.

[1 mark]

Answer _____ 20 _____ pence

18 (b) Work out the charge per minute.

[2 marks]

Fixed Charge = 20

For 1 minute = 28 - 20

= 8

Answer _____ 8 _____ pence

18 (c) Work out the cost of a phone call lasting 7 minutes.

[2 marks]

5 calls will Cost 60 Pence.

2 extra calls = (2 × 8) = 16 Pence

Total Cost for 7 minutes Call = 60 + 16

= 76

Answer _____ 76 _____ pence

Turn over for the next question

5

Turn over ▶

19   A company sells bags of toffees and bags of mints.

> Here are the numbers of sweets in 11 bags of toffees.
>
> 55   50   49   51   55   47   54   50   49   55   57

> Here are the numbers of sweets in 10 bags of mints.
>
> 46   47   47   48   48   50   53   54   54   54

The company claims that the average number of sweets per bag is at least 50

Using medians, is the company's claim correct for each type of sweet?

You **must** work out the median for toffees and the median for mints.

[4 marks]

Toffees   Arrange toffees in order; 47, 49, 49, 50, 50, 51, 54, 55, 55, 55, 57 (Median = 51

Tick a box for toffees.

[✓] Yes   [ ] No

Mints   Median = $\dfrac{48+50}{2} = \dfrac{98}{2} = 49$

Tick a box for mints.

[ ] Yes   [✓] No

Number of toffees is greater than 50 while Mints is less than 50.

20 Freddie tries to work out $\dfrac{29.15 + 83.47}{9.82}$

His answer is 37.65

By rounding each number to the nearest 10, show that his answer is incorrect.

[3 marks]

29.15 rounded = 30, 83.47 rounded to ten = 80

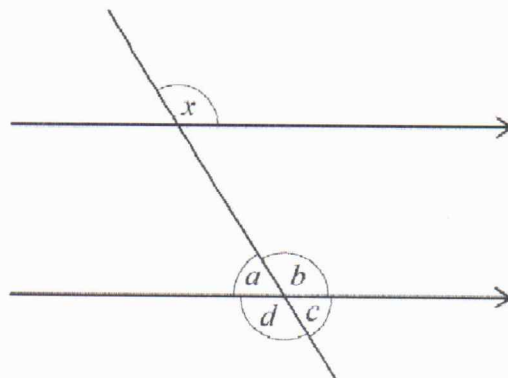and 9.82 rounded to ten = 10

$$\dfrac{30 + 80}{10}$$

$$= \dfrac{110}{10}$$

$$= 11$$

21 A straight line passes through two parallel lines.

Not drawn
accurately

$b = d$, $a = c$, they
are vertically
opposite angles and
are equal.

Circle the angle that is **corresponding** to angle x.

[1 mark]

a $\quad$ (b) $\quad$ c $\quad$ d

X and a are
alternate angles.

8

Turn over ▶

18

22 (a) Lucy wants to simplify $6a - (7b - 2a)$

She writes $4a - 7b$

Is she correct?

Tick a box.

☐ Yes ✓ No

Give a reason for your answer. $- \times - = +$

[1 mark]

$6a - (7b - 2a)$ | A negative and negative
$6a - (-2a) - 7b$ | sign is always positive.
$8a - 7b$ | So $6a - (-2a) = 8a$ but
| not $4a$.

22 (b) Lucy also wants to simplify $3p^2 \times 5p^7$

She says,

"Add 3 and 5, then add 2 and 7"

Her answer is $8p^9$

Tick a box for each part of her method.

[1 mark]

$3p^2 \times 5p^7$
$= 15p^{2+7}$
$= 15p^9$

	Correct	Not correct
Add 3 and 5	☐	✓
Add 2 and 7	✓	☐

Lucy is required to multiply 3 and 5 then add the powers (index) of p (ie)

$$p^2 \times p^7 = p^{2+7}.$$

19

22 (c) Lucy thinks of a number.

10 × the number = 10 ÷ the number

$10 \times x = \dfrac{10}{x}$

Give a possible value of the number.

$x \times 10x = \dfrac{10}{x} \times x$

[1 mark]

let the number be = x

$\dfrac{10x^2}{10} = \dfrac{10}{10}$

$x^2 = 1 \qquad x = +1 \text{ or } -1$

Answer $\quad x = 1 \text{ or } x = -1$

23 Lily's age is 2 years and 4 months.

Hugo's age is 1 year and 8 months.

Write Lily's age in months as a fraction of Hugo's age in months.

Give your fraction in its simplest form.

[2 marks]

Lily's age = 2 years 4 Months = $2\frac{1}{3}$ yrs

Hugo's age = 1 year 8 Months = $1\frac{8}{12}$ yrs or $1\frac{4}{6}$ yrs

$\dfrac{2\frac{1}{3}}{1\frac{4}{6}} = \dfrac{\frac{7}{3}}{\frac{10}{6}} = \dfrac{7}{3} \div \dfrac{10}{6} = \dfrac{7}{3} \times \dfrac{6}{10} = \dfrac{42}{30}$

$\dfrac{42^{7}}{30_{5}} = \dfrac{7}{5} = 1\frac{2}{5}$

Answer $\quad 1\frac{2}{5}$

5

24 Working alone, it takes Kevin 4 hours to paint an area of 12 m^2

Kevin and Steve are going to paint an area of 24 m^2

Kevin says,

"Working together at the same rate it will take us 8 hours, because 24 is 2 × 12"

Is he correct?

Tick a box.

$1 - 4hrs \rightarrow 12m^2$

☐ Yes

☑ No $\quad 2-8hrs \rightarrow 24m^2$

Give a reason for your answer.

[1 mark]

No, It will be the same area each, that is 12m^2 and it will depend on how fast steve works.

25 (a) Solve $5x + 6 > 3x + 15$

[3 marks]

$5x + 6 > 3x + 15$

$5x - 3x > 15 - 6$

$\dfrac{2x}{2} > \dfrac{9}{2}$

$x > 4\frac{1}{2}$

Answer $x > 4\frac{1}{2}$

25 (b) Write down the inequality represented by the number line.
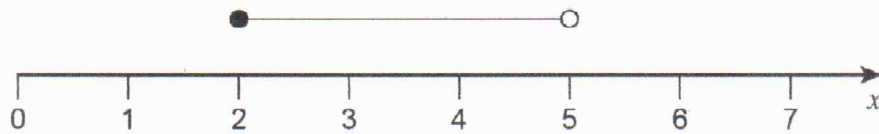
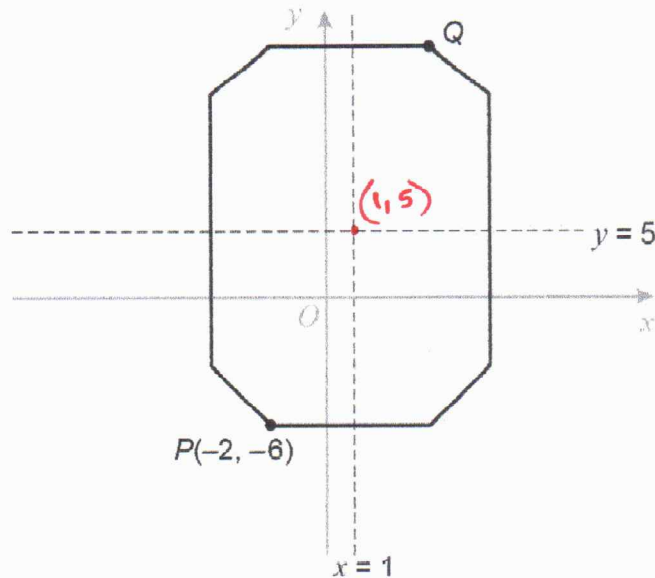

$2 \leq x$ and $x < 5$

[2 marks]

Answer $2 \leq x < 5$

6

26 The diagram shows an octagon.

Not drawn
accurately

$x = 1$ and $y = 5$ are lines of symmetry.

Work out the coordinates of point Q.

$\left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2} \right)$ — Midpoint of a line

[2 marks]

The Midpoint of PQ (1, 5)

$\dfrac{-2 + x_2}{2} = 1 \times 2$	$\dfrac{-6 + y_2}{2} = 5 \times 2$
$-2 + x_2 = 2$	$-6 + y_2 = 10$
$x_2 = 4$	$y_2 = 10 + 6 \quad y_2 = 16$

Answer (__4__ , __16__)

27 (a)   Work out $2000 \times 70\,000$

Give your answer in standard form.

[2 marks]

2000×70000 2000×70000

$= 140000000$ $2.0 \times 10^3 \times 7.0 \times 10^4$

$= 1.4 \times 10^8$ $14 \times 10^3 \times 10^4$

                     $1.4 \times 10^3 \times 10^4 \times 10^1 \quad (3+4+1)$
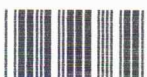
                     1.4×10^8

Answer 1.4×10^8

27 (b)   Work out $\dfrac{1.8 \times 10^2}{3 \times 10^{-1}}$

Give your answer as an ordinary number.

[2 marks]

$1.8 \times 10^2 = 180$

$3 \times 10^{-1} = 0.3$

$\dfrac{180 \times 10}{0.3 \times 10}$

$= \dfrac{1800}{3}$

$= 600$

Answer 600

6

Turn over ▶

28   *A*, *B*, *C* and *D* are junctions on a motorway.

Not drawn
accurately

A   B   C   D

distance *CD* = 3 × distance *AB*

distance *BC* = 25 miles

Salma drives from *A* to *C*.

She drives for 30 minutes at an average speed of 62 miles per hour.

Work out the distance *AD*.

30 Minutes = $\frac{1}{2}$ hour   [4 marks]

Distance = Speed × time

Distance AC = 62 Miles

Time = $\frac{1}{2}$ hour

D = 62 × $\frac{1}{2}$

D = 3

AC = 31 Miles

Distance AB = AC − BC

= 31 − 25

= 6 Miles

Distance CD = 3 × AB

CD = 3 × 6

CD = 18 miles

Distance AD = AB + BC +

CD = 6 + 25 + 18

AD = 49 miles

Answer _____ 49 _____ miles

29   Here is a sketch of a graph.
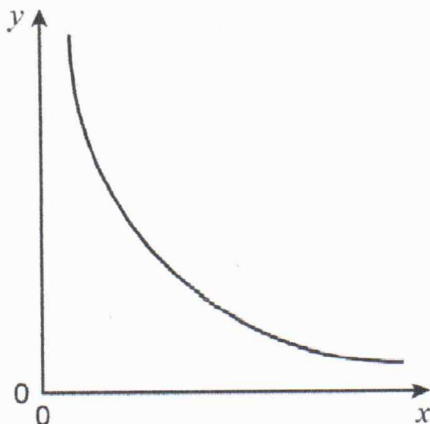
Circle the equation of the graph.

k is a constant.

[1 mark]

$$y = kx \qquad\qquad y = k + x \qquad\qquad y = k - x \qquad\qquad \boxed{y = \dfrac{k}{x}}$$

30   Write 200 as a product of prime factors.

Give your answer in index form.

[3 marks]

$$200$$
$$2 \quad 100$$
$$2 \quad 50$$
$$2 \quad 25$$
$$5 \quad 5$$

$$2 \times 2 \times 2 \times 5 \times 5$$
$$= 2^3 \times 5^2$$

Answer $2^3 \times 5^2$

8

Turn over ▶

31   Here is a right-angled triangle.

Not drawn accurately

30°

10 cm

x
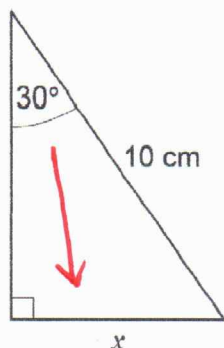
SOH

$\sin 30° = \frac{1}{2}$

Use trigonometry to work out the value of x.

[3 marks]

$\sin \theta = \dfrac{\text{Opposite}}{\text{Hypotenuse}}$

$\sin 30° = \dfrac{x}{10}$

$\dfrac{1}{2} = \dfrac{x}{10}$

$\dfrac{2x}{\cancel{x}} = \dfrac{10}{2}$

$x = 5 \text{ CM}$

Answer   **5**   cm

32   Factorise $x^2 + 7x + 10$

[2 marks]

Using factorisation   Product = 1×10 = 10

Sum = 7

two numbers we add = 7 and Multiply = 10 (5, 2)

$x^2 + 7x + 10 = x^2 + 5x + 2x + 10$

$x(x+5) + 2(x+5)$

$= (x+5)(x+2)$

Answer $(x+2)(x+5)$

END OF QUESTIONS

5