AQA

MATHS MADE EASY

GCSE
MATHEMATICS

F

Foundation Tier . Paper 1 Non-Calculator

Thursday 25 May 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	
TOTAL	

Answer all questions in the spaces provided

1   How many minutes are there in $3\frac{1}{2}$ hours?

Circle your answer.

[1 mark]

180.5   (210)   330   350

$3 \times 60 = 180, \quad \frac{1}{2} \times 60 = 30, \quad 180 + 30 = 210$

2   Work out $\frac{1}{4} + 0.5$

Circle your answer.

[1 mark]

0.30   0.6   (0.75)   0.9

$0.5 = \frac{1}{2} = \frac{2}{4}, \quad \frac{1}{4} + 0.5 = \frac{1}{4} + \frac{2}{4} = \frac{3}{4} = 0.75$

3   Which of these shapes has the most sides?

Circle your answer.

[1 mark]

Hexagon   (Octagon)   Rhombus   Trapezium

6   8   4   4

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4 Solve $x - 3 = 0$

Circle your answer.

[1 mark]

$x = -3$ $x = 0$ $x = \dfrac{1}{3}$ $\boxed{x = 3}$

$$+3 \left| \begin{array}{c} x - 3 = 0 \\ x = 3 \end{array} \right| +3$$

5 Work out 58×73

[3 marks]

$$
\begin{array}{r}
58 \\
73 \times \\
\hline
1\,7^24 \\
4\,0^560 \\
\hline
4\,2^134 \\
\end{array}
$$

$$58 \times 73 = 4234$$

Answer _____ 4234 _____

Turn over ▶

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6   500 people are asked if they drink coffee.

$\frac{9}{10}$ say Yes.

20% of the people who say Yes drink at least three cups each day.
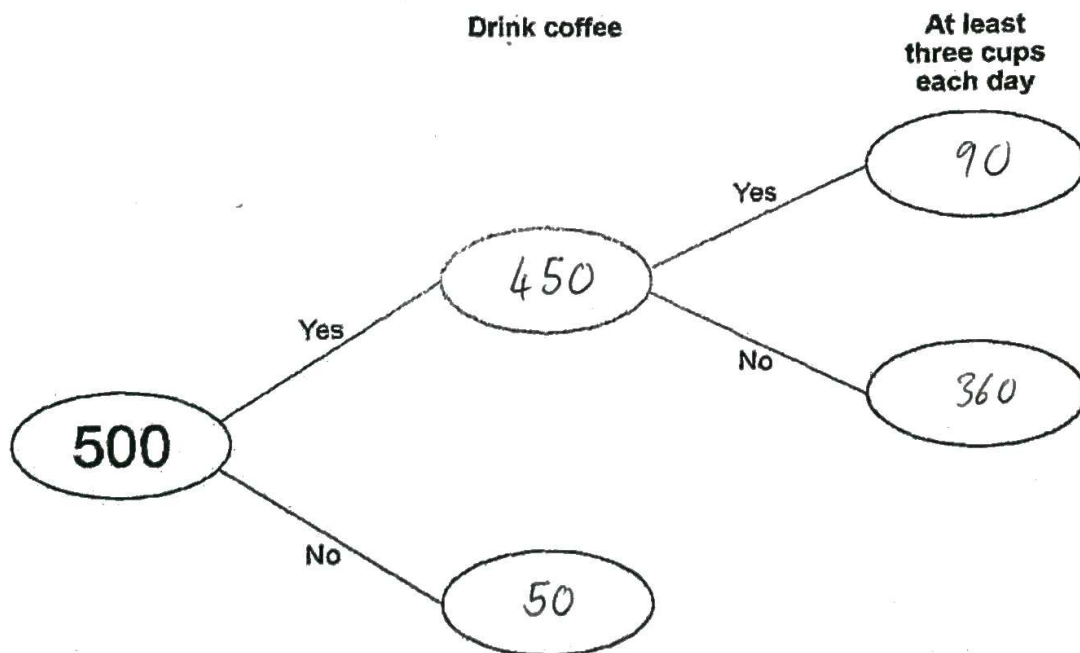
6 (a)   Complete the frequency tree.

[4 marks]

$$\frac{1}{10} \times 500 = 50, \quad 9 \times 50 = 450$$

$$10\% \ OF \ 450 = 45, \quad 20\% = 90$$

$$450 - 90 = 360$$

Drink coffee ... **At least three cups each day**

500 — Yes → 450 — Yes → 90

450 — No → 360

500 — No → 50

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6 (b) What fraction of the 500 people drink at least three cups of coffee each day?

Give your answer in its simplest form.

[2 marks]

$$\frac{90}{500} = \frac{9}{50}$$

Answer _____ $\frac{9}{50}$ _____

7 By rounding each number to the nearest 10,

estimate the answer to $\dfrac{61 \times 47}{102}$

You must show your working.

[2 marks]

$$\frac{60 \times 50}{100} = \frac{3000}{100} = \frac{30}{1} = 30$$

Answer _____ 30 _____

Turn over for the next question

8

Turn over ▶

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8   Nadia has £5 to buy pencils and rulers.

Prices	
Pencils	8p each
Rulers	30p each

She says,

     "I will buy 15 pencils.

     Then I will buy as many rulers as possible.

     With my change I will buy more pencils."

How many pencils and how many rulers does she buy?

[6 marks]

15 PENCILS = 15 × 8 = (10×8) + (5×8) = 80+40 = 120p

                             = £1.20

REMAINING: £5 − £1.20 = £3.80

£3 = 10 × 30p = 10 RULERS } £3.60 FOR 12

60p = 2 × 30p = 2 RULERS }   RULERS

£3.80 − £3.60 = 20p   (NOT ENOUGH FOR MORE

                                   RULERS)

16p = 2 × 8p = 2 PENCILS, WITH 4p LEFT.

TOTALS: 12 RULERS, 15 + 2 = 17 PENCILS

Answer   **17**   pencils,   **12**   rulers

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9 Work out   25.68 ÷ 12

[2 marks]

$$12 \overline{)25.68} = 02.14$$

Answer _____ 2.14 _____

10 Work out $\frac{3}{8} \times 11$

Give your answer as a mixed number.

[2 marks]

$$\frac{3}{8} \times 11 = \frac{3}{8} \times \frac{11}{1} = \frac{33}{8} = \frac{32+1}{8}$$
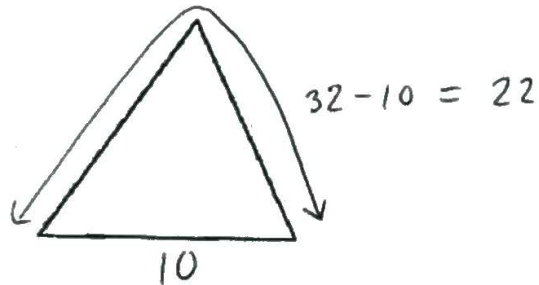$$= 4\frac{1}{8}$$

Answer _____ $4\frac{1}{8}$ _____

10

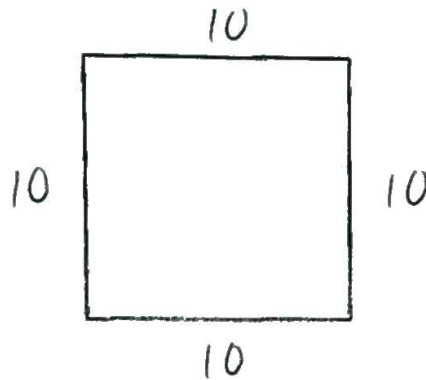MATHS MADE EASY
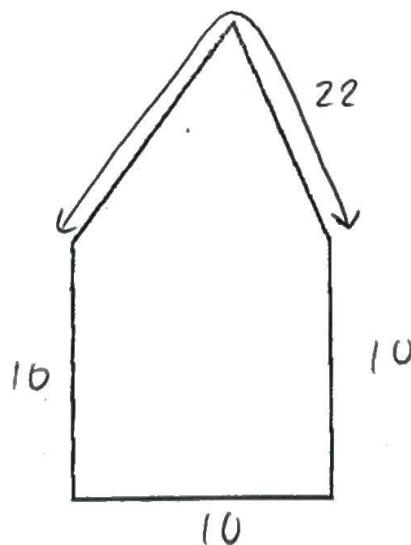
11   A triangle has perimeter 32 cm

$32 - 10 = 22$

10

Not drawn
accurately

A square has perimeter 40 cm

10

10   10

10

Two sides of the shapes are put together to make a pentagon.

Not drawn
accurately

22

10   10

10

1 0 8

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Work out the perimeter of the pentagon.

[4 marks]

$\frac{40}{4}$ = 10 cm = SIDE - LENGTH OF SQUARE

ALSO 10 cm = BASE OF TRIANGLE

OTHER 2 SIDES OF TRIANGLE = 32 - 10 = 22.

3 SIDES OF SQUARE = 30 cm

TOP 2 SIDES OF PENTAGON = 22 cm

PERIMETER = 30 + 22 = 52 cm

Answer _____52_____ cm

Turn over for the next question

4

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12 A football team has P points.

$$P = 3W + D$$

W is the number of wins
D is the number of draws

12 (a) A team has 6 wins and 2 draws.

How many points does the team have?

[1 mark]

$P = (3 \times 6) + 2 = 18 + 2 = 20$

Answer ___20___

12 (b) After 33 games a different team has 53 points.
11 games were draws.

How many games has this team lost?

[4 marks]

$P = 53, \quad D = 11$

$P = 3W + D \Rightarrow \begin{array}{c|c} & 53 = 3W + 11 \\ -11 & 42 = 3W \\ \div 3 & 14 = W \end{array} \begin{array}{c} -11 \\ \div 3 \end{array}$

14 WINS, SO NUMBER OF LOSSES $= 53 - 14 - 11 = 28$

Answer ___28___

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13 $2 + 0 + 1 + 7 = 10$

Make the following calculations correct.

Use only the symbols $+, -, \times, \div$ and $()$

[3 marks]

$2 + 0 + 1 - 7 = -4$

$2 \times 0 \times 1 \times 7 = 0$

$(2 + 0) \times (1 + 7) = 2^4$

$2^4 = 2 \times 2 \times 2 \times 2$
$ = 16$

Turn over for the next question

8

Turn over ▶

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14 A number is picked at random from the first four **prime** numbers.

A number is picked at random from the first four **square** numbers.

The two numbers are added to get a score.

14 (a) Complete the table.

[4 marks]

Square numbers

+	1	4	9	16
2	3	6	11	18
3	4	7	12	19
5	6	9	14	21
7	8	11	16	23

Prime numbers

14 (b) What is the probability that the score is a prime number?

[1 mark]

Answer $\frac{3}{8}$

$$3, \ 11, \ 7, \ 19, \ 11, \ 23$$

$$6$$

$$\frac{6}{16} = \frac{3}{8}$$

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15 In a school show,

girls : boys = 1 : 1

girls who sing : girls who do not sing = 1 : 2

8 girls **sing** in the show.

How many students are in the show altogether?

[3 marks]

GIRLS WHO SING : GIRLS WHO DON'T : TOTAL

x8 (1 : x8 (2 : x8 (3

8 : 16 : 24

SO THERE ARE 24 GIRLS IN TOTAL

1:1 = 24:24 , SO THERE ARE 24 BOYS ALSO

24 + 24 = 48 STUDENTS

Answer _____ 48 _____

Turn over for the next question

8

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16 P and Q are points on the line $3x + 2y = 6$

16 (a)   Complete the coordinates of P and Q.

[2 marks]

$$x = 0: \quad \div 2 \begin{vmatrix} 2y = 6 \\ y = 3 \end{vmatrix} \div 2 \qquad y = 0: \quad +3 \begin{vmatrix} 3x = 6 \\ x = 2 \end{vmatrix} \div 3$$

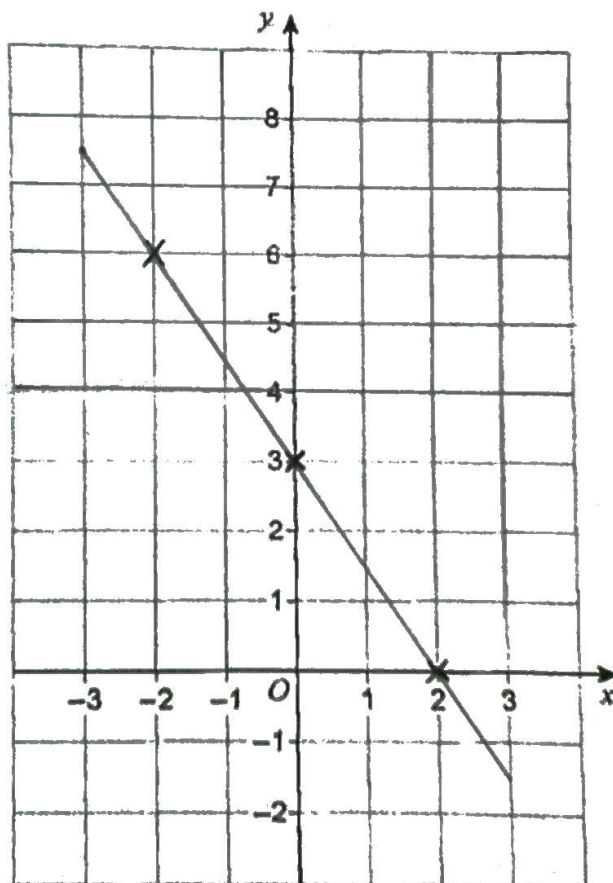$P \ (0, \ \underline{3} \ ) \qquad Q \ (\underline{2} , 0)$

16 (b)   Draw the line $3x + 2y = 6$ for values of x from -3 to 3

[2 marks]

$x = -2:$

$3(-2) + 2y = 6$

$+6 \begin{vmatrix} -6 + 2y = 6 \\ 2y = 12 \\ \div 2 \quad y = 6 \end{vmatrix} \begin{matrix} +6 \\ \div 2 \end{matrix}$

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17 Circle the expression which does **not** simplify to y^3

[1 mark]

$y \times y \times y$　　　　$y^4 \div y$　　　　$y^2 \times y$　　　　$\boxed{y^6 \div y^2}$

y^3　　　　　　y^3　　　　　　y^3　　　　　　y^4

18 Write the number　six million five thousand two hundred　in standard form.

[2 marks]

$\underline{6,005,200} = 6.0052 \times 10^6$

1　2　3　4　5　6

Answer　6.0052×10^6

Turn over for the next question

7

Turn over ▶

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19 (a) Use $8 \text{ km/h} = 5 \text{ mph}$ to convert 96 km/h to mph

$8 \overline{)9\,6}$ $\quad 1\,2$

[2 marks]

$$96 \div 8 = 12$$

$$12 \times 5 = 60 \text{ mph}$$

Answer _____ 60 _____ mph

19 (b) $x \text{ km/h} = y \text{ mph}$

Use $8 \text{ km/h} = 5 \text{ mph}$ to write a formula for y in terms of x.

[2 marks]

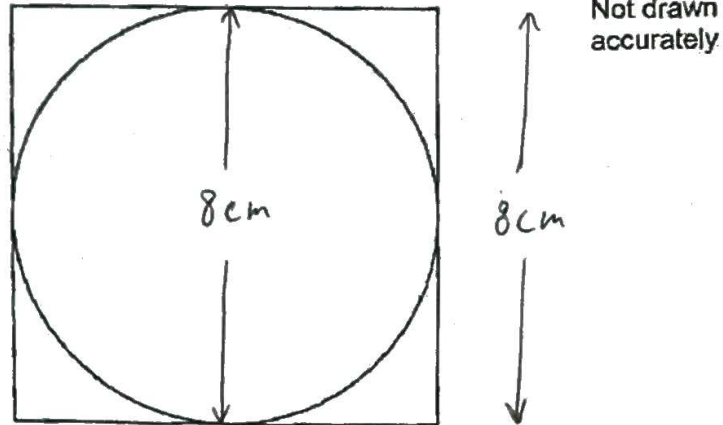$$8y = 5x \implies y = \frac{5}{8}x$$

Answer _____ $y = \frac{5}{8}x$ _____

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20   Here is a circle touching a square.

Not drawn accurately

8cm

8cm

The area of the square is 64 cm²

Work out the area of the circle.

Give your answer in terms of π.

[3 marks]

$8 \times 8 = 64,$ ⟹ SIDE OF SQUARE = 8 cm

WIDTH OF SQUARE = DIAMETER OF CIRCLE = 8 cm

⟹ RADIUS = 4 cm, AREA = $\pi r^2 = \pi \times 4^2$

$= 16\pi$

Answer 16π cm²

Turn over for the next question

7

Turn over ▶

MATHS MADE EASY

21 Billy wants to buy these tickets for a show.

  4 adult tickets at £15 each

  2 child tickets at £10 each

A 10% booking fee is added to the ticket price.

3% is then added for paying by credit card.

Work out the **total** charge for these tickets when paying by credit card.

[5 marks]

$4 \times 15 = 60$

$2 \times 10 = 20$ +

$80 = $ COST OF TICKETS

10% OF $80 = \frac{80}{10} = £8$, SO TOTAL TICKET COST

$= £88$

1% OF $£88 = \frac{88}{100} = 0.88$

3% OF $£88 = 0.88 \times 3 = 2.64$

TOTAL COST $= 88 + 2.64 = £90.64$

Answer £ _____ 90.64 _____

$\frac{88}{3} \times$

$\overline{2 6 4}$, SO $0.88 \times 3 = \frac{264}{100} = 2.64$

1 8

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22 (a) Density = $\dfrac{mass}{volume}$

The mass of solid A is 6 times the mass of solid B.
The volume of solid A is 3 times the volume of solid B.

Complete the sentence.

[1 mark]

The density of solid A is _____2_____ times the density of solid B.

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

22 (b) Average speed = $\dfrac{distance}{time}$

If the distance is halved and the time is doubled, what happens to the average speed?
Circle your answer.

[1 mark]

× 2   × 4   no change   ÷ 2   ÷ 4

Turn over for the next question

$$\frac{\frac{1}{2}}{2} = \frac{1}{2} \div 2 = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

7

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23 A regular polygon has an exterior angle of 20°

Work out the number of sides of the polygon.

$n = \#\ SIDES$

[2 marks]

$EXT.\ ANGLE = \dfrac{360}{\#\ SIDES}$

$\Rightarrow\ 20 = \dfrac{360}{n}$

$\times n \quad\quad\quad \times n$

$20n = 360$

$\div 20 \quad n = 18 \quad \div 20$

$\Rightarrow 18\ SIDES$

$20\overline{)360}\ \ 018$

Answer ___18___

24 $\dfrac{1}{2} : \dfrac{2}{3} = x : 1$

Circle the value of x.

[1 mark]

$\dfrac{1}{3}$ $\qquad$ $\dfrac{3}{5}$ $\qquad$ $\boxed{\dfrac{3}{4}}$ $\qquad$ $\dfrac{4}{3}$

$\dfrac{1}{2} : \dfrac{2}{3} = \dfrac{3}{2} : 2 = \dfrac{3}{4} : 1$

$\dfrac{3}{2} \div 2 = \dfrac{3}{2} \times \dfrac{1}{2} = \dfrac{3}{4}$

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25 The table shows information about the times for 10 people to complete a task.

Time, t (minutes)	Frequency
$0 < t \leqslant 20$	1
$20 < t \leqslant 40$	6
$40 < t \leqslant 60$	3

These statements are about the mean and range of the actual times.
Tick the correct box for each statement.

[4 marks]

LOWEST POSSIBLE MEAN $= \dfrac{(1 \times 1) + (21 \times 6) + (41 \times 3)}{10}$

$= \dfrac{1 + 126 + 123}{10} = \dfrac{250}{10} = 25$

	True	False
The mean could be less than 20 minutes		✓
The mean could be more than 40 minutes	✓	
The mean could be less than 40 minutes	✓	

HIGHEST POSSIBLE MEAN $= \dfrac{(1 \times 20) + (6 \times 40) + (3 \times 60)}{10} = \dfrac{20 + 240 + 180}{10} = \dfrac{440}{10} = 44$

	True	False
The range could be more than 40 minutes	✓	
The range could be less than 40 minutes	✓	
The range could be more than 60 minutes		✓

MINIMUM $= 41 - 20 = 21$
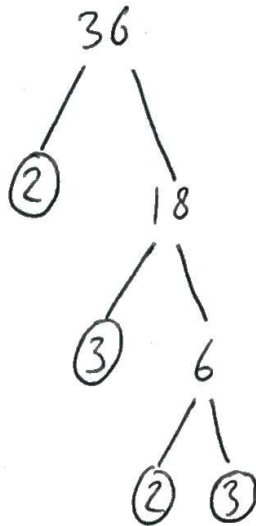
MAXIMUM $= 60 - 1 = 59$

Turn over ▶

7

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26 Write 36 as a product of prime factors.

Give your answer in index form.

[3 marks]

36

$36 = 2 \times 2 \times 3 \times 3$

$= 2^2 \times 3^2$

Answer $\underline{\quad 36 = 2^2 \times 3^2 \quad}$

27 Circle the value of cos 90°

[1 mark]

0 $\qquad$ $\dfrac{1}{2}$ $\qquad$ $\dfrac{\sqrt{3}}{2}$ $\qquad$ 1

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28   Solve the simultaneous equations.

$$2x + y = 18 \quad ①$$
$$x - y = 6 \quad ②$$

[3 marks]

$① + ②:$ $2x + y = 18 +$ SUB IN $x = 8;$

$\qquad\qquad x - y = 6$ $+y|\,8 - y = 6\,|+y$

$\qquad\qquad 3x + 0 = 24$ $-6|\,8 = 6 + y\,|-6$

$\qquad\qquad \div 3\,|\,\dfrac{3x = 24}{x = 8}\,|\div 3$ $|\,2 = y\,|$

CHECK: $2x + y = (2 \times 8) + 2 = 16 + 2 = 18$ ✓

Answer $x = 8, \; y = 2$

END OF QUESTIONS

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