

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname *StemUp Model Solution*

Forename(s)

Candidate signature

GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Thursday 25 May 2017

Morning

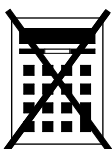
Time allowed: 1 hour 30 minutes

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	



J U N 1 7 8 3 0 0 1 F 0 1

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

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

Circle your answer.

[1 mark]

0.30

0.6

0.75

0.9

- 3** Which of these shapes has the most sides?

Circle your answer.

[1 mark]

Hexagon

Octagon

Rhombus

Trapezium



4 Solve $x - 3 = 0$

Circle your answer.

[1 mark]

$x = -3$

$x = 0$

$x = \frac{1}{3}$

$x = 3$

5 Work out 58×73

[3 marks]

$$\begin{array}{r}
 ^2 \\
 58 \\
 \times 73 \\
 \hline
 174 \\
 4060 \\
 \hline
 4234 \\
 ^1
 \end{array}$$

$58 \times 3 = 174$

$58 \times 70 = 4060$

$174 + 4060 = 4234$

Answer 4234

Turn over ►



- 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.

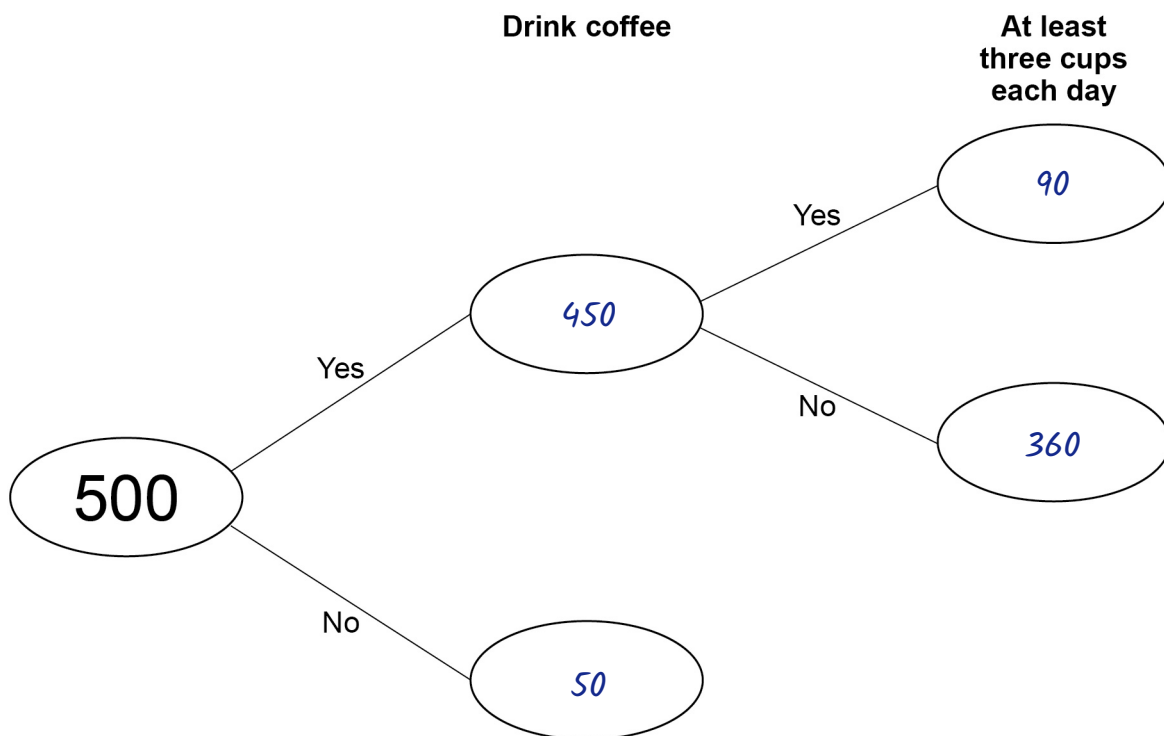
[4 marks]

9/10 of 500: $500 \div 10 = 50$, $50 \times 9 = 450$

No: $500 - 450 = 50$

20% of 450: $10\% = 45$, $20\% = 90$

No: $450 - 90 = 360$



- 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]

$$\frac{90}{500} = \frac{9}{50} \quad (\div 10)$$

Answer $\frac{9}{50}$

- 7** By rounding each number to the nearest 10,

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

You **must** show your working.

[2 marks]

$$61 \approx 60, \quad 47 \approx 50, \quad 102 \approx 100$$

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

Answer 30

Turn over for the next question

Turn over ►

- 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]

$$15 \text{ pencils: } 15 \times 8 = 120p$$

$$\text{Money left: } 500 - 120 = 380p$$

$$\text{Rulers: } 380 \div 30 = 12 \text{ remainder } 20$$

$$12 \times 30 = 360p, \text{ so } 12 \text{ rulers}$$

$$\text{Change: } 380 - 360 = 20p$$

$$20 \div 8 = 2 \text{ remainder } 4, \text{ so } 2 \text{ more pencils}$$

$$\text{Check: } 120 + 360 + 16 = 496p \text{ (4p left)}$$

$$\text{Pencils: } 15 + 2 = 17$$

Answer 17 pencils, 12 rulers



9 Work out $25.68 \div 12$

[2 marks]

$$\begin{array}{r} 02.14 \\ 12 \overline{) 25.68} \\ \underline{24} \\ 16 \\ \underline{12} \\ 48 \\ \underline{48} \\ 0 \end{array}$$

$$25 \div 12 = 2 \text{ r } 1, 16 \div 12 = 1 \text{ r } 4, 48 \div 12 = 4$$

Answer 2.14

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

Give your answer as a mixed number.

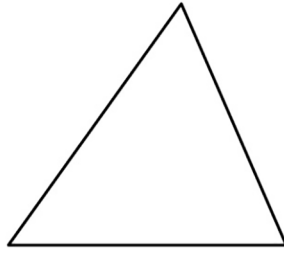
[2 marks]

$$\frac{3}{8} \times 11 = \frac{3 \times 11}{8} = \frac{33}{8} = 4 \frac{1}{8} \quad (33 \div 8 = 4 \text{ remainder } 1)$$

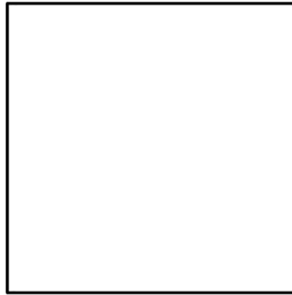
Answer $4 \frac{1}{8}$



- 11 A triangle has perimeter 32 cm

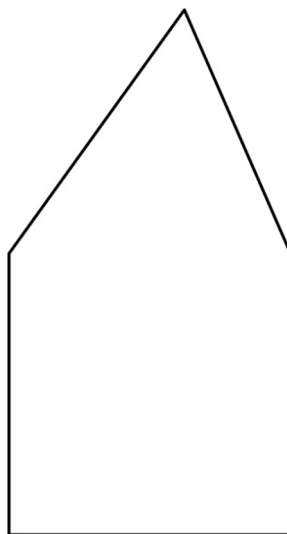


A square has perimeter 40 cm



Not drawn
accurately

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



Not drawn
accurately



Work out the perimeter of the pentagon.

[4 marks]

$$\text{Square side} = 40 \div 4 = 10 \text{ cm}$$

Shared side = 10 cm, so other two triangle sides

$$= 32 - 10 = 22 \text{ cm}$$

Pentagon = 3 square sides + 2 triangle sides

$$= 3 \times 10 + 22 = 30 + 22 = 52 \text{ cm}$$

Answer 52 cm

Turn over for the next question

Turn over ►



- 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]

$$\text{Points from wins} = 53 - 11 = 42$$

$$\text{Wins} = 42 \div 3 = 14$$

$$\text{Lost} = 33 - 14 - 11$$

$$= 8$$

$$\text{Check: } 3 \times 14 + 11 = 53$$

Answer 8



13

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

Make the following calculations correct.

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

[3 marks]

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

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

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

Turn over for the next question

Turn over ►



- 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			
Prime 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

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

[1 mark]

Primes: 3, 11, 7, 19, 11, 23 = 6 out of 16

Answer $\frac{6}{16}$ or $\frac{3}{8}$



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]

$$\text{Girls who do not sing} = 8 \times 2 = 16$$

$$\text{Girls} = 8 + 16 = 24$$

$$\text{Boys} = \text{girls} = 24$$

$$\text{Total} = 24 + 24 = 48$$

Answer 48**Turn over for the next question****Turn over ►**

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

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

[2 marks]

$$P: x = 0, 2y = 6, y = 3$$

$$Q: y = 0, 3x = 6, x = 2$$

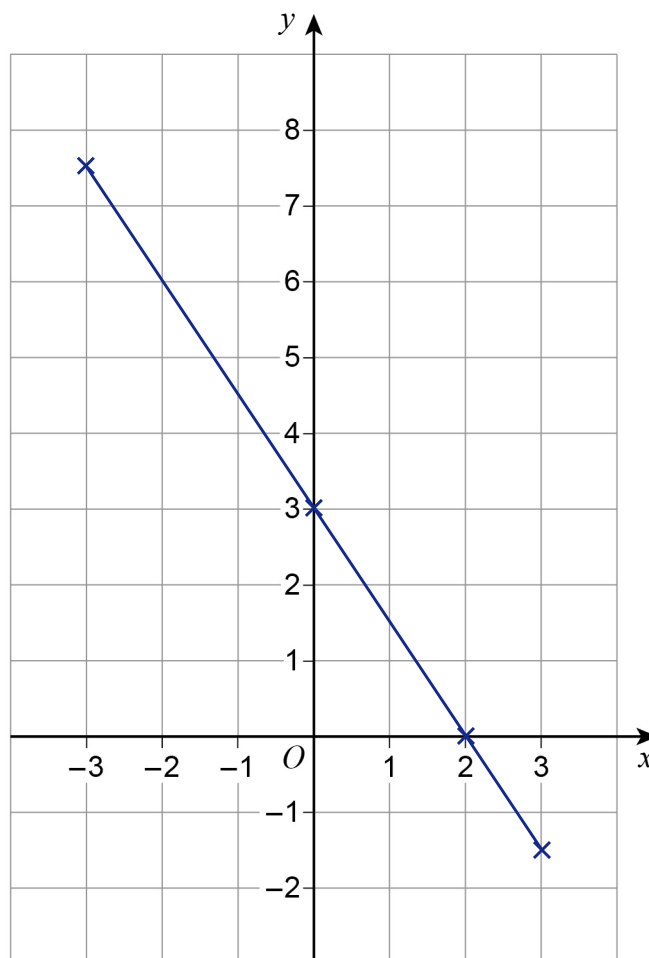
$$P (0, 3) \quad Q (2, 0)$$

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

[2 marks]

$$\begin{aligned} x &= -3, \\ 2y &= 6 + 9 \\ y &= 7.5 \end{aligned}$$

$$\begin{aligned} x &= 3, \\ 2y &= 6 - 9 \\ y &= -1.5 \end{aligned}$$



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

[1 mark]

$y \times y \times y$

$y^4 \div y$

$y^2 \times y$

$y^6 \div y^2$

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

[2 marks]

$$6\,005\,200 = 6.0052 \times 1\,000\,000$$

Answer 6.0052×10^6

Turn over for the next question

Turn over ►



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

[2 marks]

$$96 \div 8 = 12$$

$$12 \times 5 = 60$$

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]

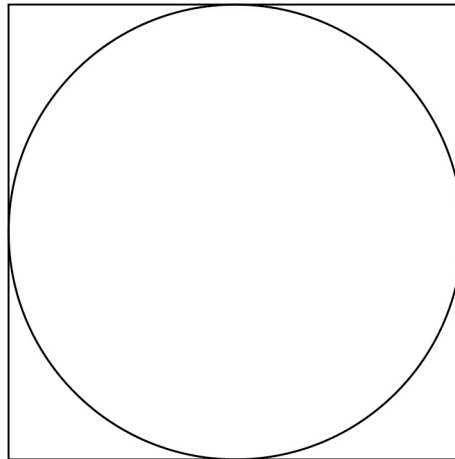
$$1 \text{ km/h} = \frac{5}{8} \text{ mph, so } x \text{ km/h} = \frac{5}{8} \times x \text{ mph}$$

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



20

Here is a circle touching a square.

Not drawn
accuratelyThe area of the square is 64 cm^2

Work out the area of the circle.

Give your answer in terms of π .**[3 marks]**

$$\text{Side} = \sqrt{64} = 8 \text{ cm, so diameter} = 8 \text{ cm}$$

$$\text{Radius} = 8 \div 2 = 4 \text{ cm}$$

$$\text{Area} = \pi \times 4^2 = \pi \times 16$$

$$= 16\pi$$

Answer 16π cm^2 **Turn over for the next question****Turn over ►**

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]

$$\text{Tickets: } 4 \times 15 = 60, 2 \times 10 = 20, 60 + 20 = £80$$

$$\text{Booking fee: } 10\% \text{ of } 80 = 8$$

$$80 + 8 = £88$$

$$\text{Card fee: } 1\% \text{ of } 88 = 0.88$$

$$3\% = 3 \times 0.88 = 2.64$$

$$\text{Total} = 88 + 2.64 = £90.64$$

Answer £ 90.64



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

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.

$$6 \div 3 = 2$$

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

If the distance is halved and the time is doubled, what happens to the average speed?

Circle your answer.

[1 mark]

$\times 2$

$\times 4$

no change

$\div 2$

$\div 4$

Turn over for the next question



- 23** A regular polygon has an exterior angle of 20°

Work out the number of sides of the polygon.

[2 marks]

Exterior angles add to 360°

$$360 \div 20 = 18$$

Answer 18

- 24** $\frac{1}{2} : \frac{2}{3} = x : 1$

Circle the value of x .

[1 mark]

$$\frac{1}{3}$$

$$\frac{3}{5}$$

$$\frac{3}{4}$$

$$\frac{4}{3}$$



25

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

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

These statements are about the mean and range of the actual times.

Tick the correct box for each statement.

[4 marks]

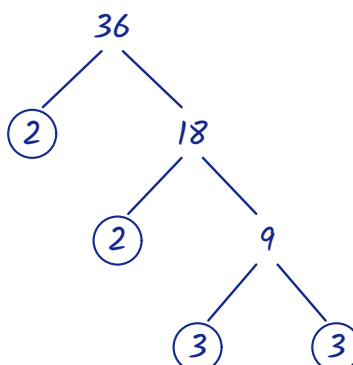
	True	False
The mean could be less than 20 minutes	☐	☒
The mean could be more than 40 minutes	☒	☐
The mean could be less than 40 minutes	☒	☐
The range could be more than 40 minutes	☒	☐
The range could be less than 40 minutes	☒	☐
The range could be more than 60 minutes	☐	☒

Turn over ►



- 26 Write 36 as a product of prime factors.
Give your answer in index form.

[3 marks]



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

Answer $2^2 \times 3^2$

- 27 Circle the value of $\cos 90^\circ$

[1 mark]

0

$\frac{1}{2}$

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

1



28 Solve the simultaneous equations.

$$2x + y = 18$$

$$x - y = 6$$

[3 marks]

$$\text{Add: } (2x + y) + (x - y) = 18 + 6$$

$$3x = 24$$

$$x = 8$$

$$\text{Substitute into } x - y = 6: 8 - y = 6$$

$$y = 2$$

$$\text{Check: } 2 \times 8 + 2 = 18$$

Answer $x = 8, y = 2$

END OF QUESTIONS



There are no questions printed on this page

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