

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

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GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Thursday 25 May 2017

Morning

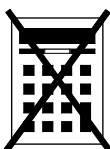
Time allowed: 1 hour 30 minutes

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]

$3\text{ hours} = 3 \times 60 = 180\text{ min}$
 $\frac{1}{2}\text{ h} = 0.5 \times 60 = 30$
 $\frac{180}{\quad} + \frac{30}{\quad} = \frac{210}{\quad}$
 210 330 350

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

Circle your answer.

[1 mark]

$\frac{1}{4} = 0.25$
 $0.25 + 0.5 = 0.75$
 0.30 0.6 0.75 0.9

- 3 Which of these shapes has the most sides?

Circle your answer.

[1 mark]

$\frac{\text{Hexagon}}{6}$ $\frac{\text{Octagon}}{8}$ $\frac{\text{Rhombus}}{4}$ $\frac{\text{Trapezium}}{4}$



- 4 Solve $x - 3 = 0$ $x = 3$
 Circle your answer.

[1 mark]

$x = -3$

$x = 0$

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

$x = 3$

- 5 Work out 58×73

[3 marks]

$$\begin{array}{r}
 73 \\
 \times 58 \\
 \hline
 584 \\
 3,650 \\
 \hline
 4234
 \end{array}$$

Answer 4234

Turn over ►



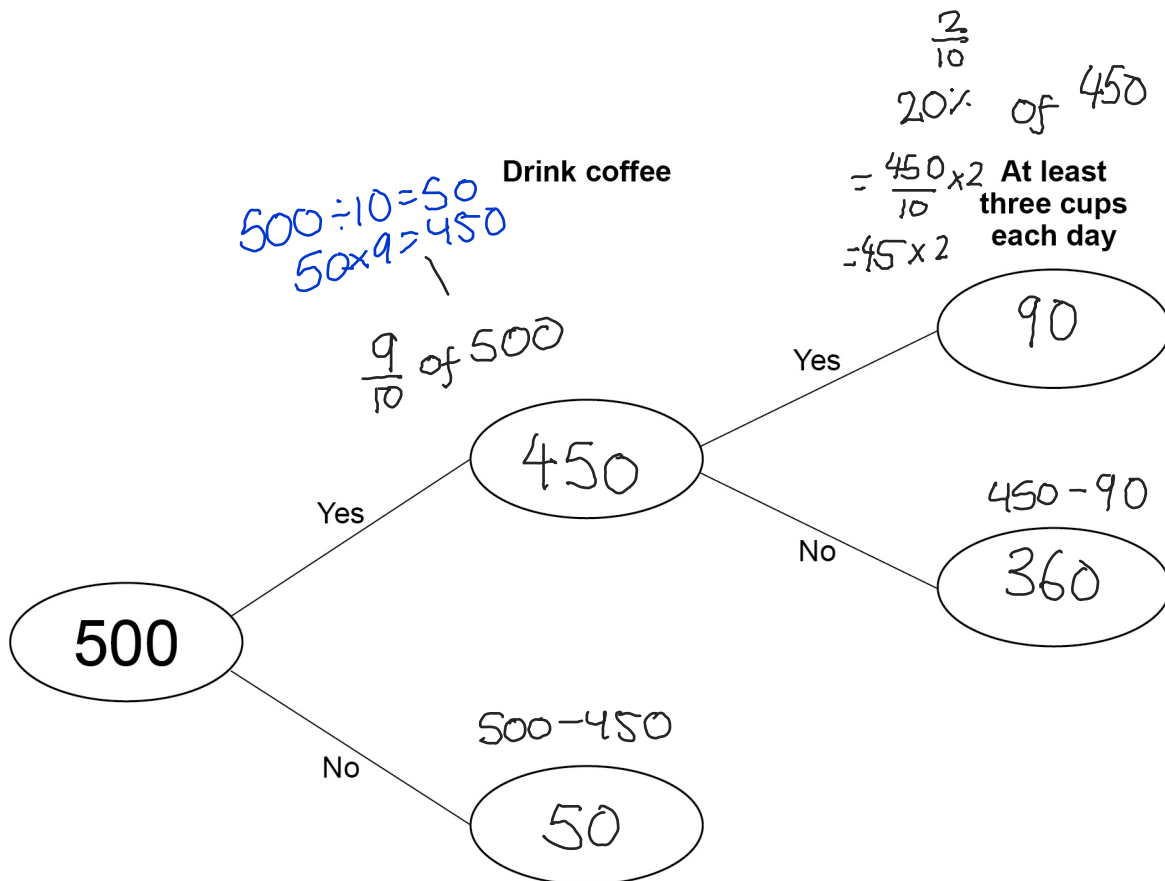
6 500 people are asked if they drink coffee.

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

20% of the people who say Yes drink at least three cups each day.

6 (a) Complete the frequency tree.

[4 marks]



- 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 $\frac{61 \times 47}{102}$

You **must** show your working.

[2 marks]

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

$$30 \div 1$$

$$= 30$$

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. $\times 8p$

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]

$$\begin{array}{r} 15 \\ \times 8 \\ \hline 120 \end{array}$$

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

$$500p - 120p = 380p$$

$$380 \div 30 = 12 \text{ r } 20p$$

$$= 12 \text{ rulers}$$

buy maximum
possible
rulers

$$20p \div 8p = 2 \text{ r } 4$$

$$= 2 \text{ more pencils}$$

can use the 20p
change

$$15 + 2$$

Answer 17 pencils, 12 rulers



9 Work out $25.68 \div 12$

$$\begin{array}{r}
 2.14 \\
 \hline
 12 \overline{) 25.680}
 \end{array}$$

[2 marks]

Answer 2.1410 Work out $\frac{3}{8} \times 11$

Give your answer as a mixed number.

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

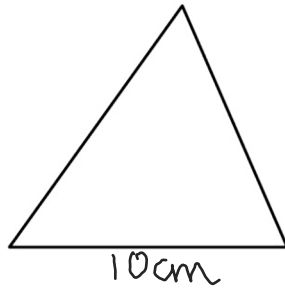
[2 marks]

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

33-32

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

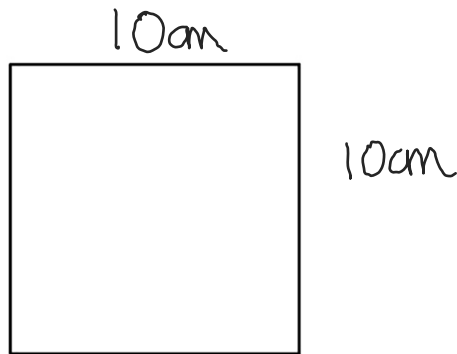
- 11 A triangle has perimeter 32 cm



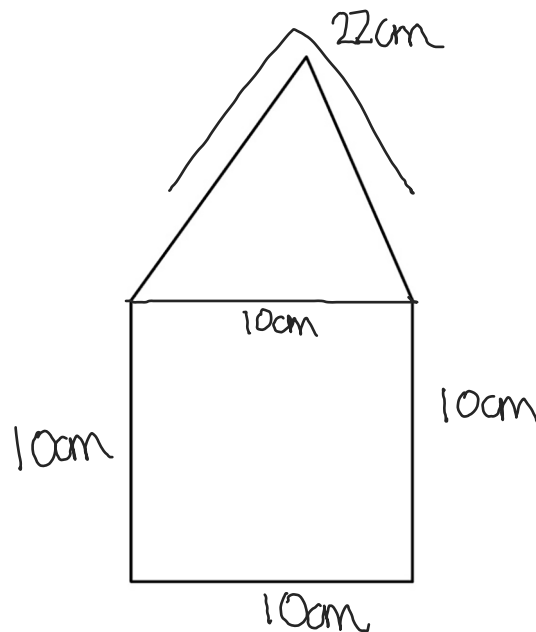
Not drawn
accurately

- A square has perimeter 40 cm

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



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



Not drawn
accurately



Work out the perimeter of the pentagon.

[4 marks]

Perimeter of 2 other sides of triangle:
 $32 - 10 = 22\text{cm}$

$$22 + 10 + 10 + 10 = 52\text{cm}$$

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]

$$\begin{aligned} P &= 3 \times 6 + 2 \\ &= 18 + 2 \end{aligned}$$

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]

$$P = 3W + D$$

$$53 = 3W + 11$$

substitute

$$42 = 3W$$

$$14 = W \quad \leftarrow \text{Wins } 14$$

$$33 - 11 - 14 = 8$$

Total draws

Answer 8



13

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

Make the following calculations correct.

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

[3 marks]

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

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

$$(2 + 0) \times (1 + 7) = 2^4 = 16$$

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			
+		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]

$$\frac{6 \text{ prime}}{16 \text{ total}}$$

Answer $= \frac{3}{8}$



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]

$$\begin{array}{l} \text{g sing} \quad \text{g don't sing} \\ 1 : 2 \\ \times 8 \quad \curvearrowright \\ \hline \rightarrow 8 : 16 \end{array}$$

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

$$\begin{array}{l} \text{g} \quad \text{b} \\ 1 : 1 \\ \times 24 \quad \curvearrowleft \quad \times 24 \\ \hline \rightarrow 24 : 24 \leftarrow \end{array}$$

$$24 + 24 =$$

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]

$$P: \text{When } x=0 \quad 0 + 2y = 6$$

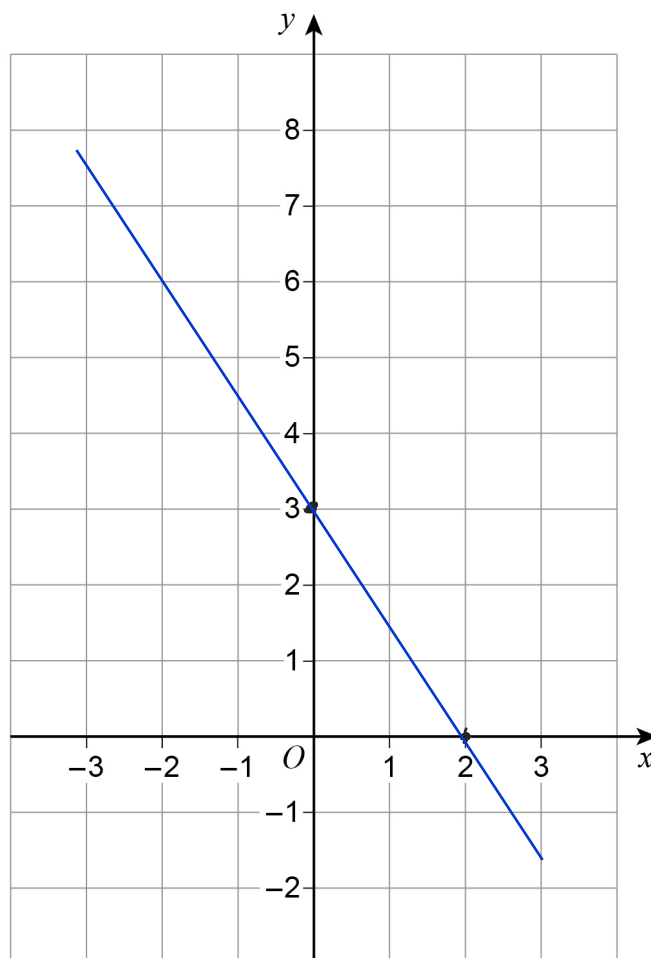
$$y = 3$$

$$Q: \text{When } y=0 \quad 3x + 0 = 6, \quad x = 2$$

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

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

[2 marks]



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

$$y \times y \times y$$

$$y^3$$

$$y^4 \div y$$

$$= y^{4-1} = y^3$$

$$y^2 \times y$$

$$y^{2+1} = y^3$$

$$y^6 \div y^2$$

$$y^{6-2} = y^4$$

[1 mark]

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

[2 marks]

6,005,200

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]

$$\begin{array}{l} 8 \text{ km/h} : 5 \text{ mph} \\ 96 \text{ km/h} : 60 \text{ mph} \end{array}$$

(Handwritten: $\times 12$ on the left and right sides with arrows pointing to the conversion factors)

Answer 60 mph 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]

$$\begin{array}{l} 5x = 8y \\ \frac{5}{8}x = y \end{array}$$

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



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]**

$$\begin{array}{r} \text{Adults cost: } 4 \times 15 = \text{£}60 \\ \text{Child cost: } 2 \times 10 = \text{£}20 \\ \hline \text{£}80 \text{ cost} \\ \hline \text{10\% booking fee: } 80 \times 0.1 = 8 \\ \hline = \text{£}88 \text{ with booking fee} \end{array}$$

$$\begin{array}{r} \text{3\% credit cost:} \\ \hline \text{1\%} = 0.88 \\ \text{3\%} = \frac{1}{100} \times 88 = 2.64 \\ \hline 88 + 2.64 = \text{£}90.64 \end{array}$$

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.

$$\frac{6}{3}$$

Complete the sentence.

[1 mark]

The density of solid A is 2 times the density of solid B.

22 (b) Average speed = $\frac{\text{distance}}{\text{time}}$ $\frac{\times \frac{1}{2}}{\times 2} = \frac{\times 1}{4} = \div 4$

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]

$$\text{Exterior} = \frac{360}{n} \quad \leftarrow \text{number of sides}$$

$$20 = \frac{360}{n}$$

$$n = \frac{360}{20}$$

Answer

18

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

Circle the value of x .

[1 mark]

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

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

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

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

$$\begin{array}{ccc} \frac{1}{2} & : & \frac{2}{3} \\ \downarrow \div \frac{2}{3} & & \downarrow \div \frac{2}{3} \\ x & : & 1 \end{array}$$

$$\begin{aligned} \frac{1}{2} & : \frac{2}{3} \\ & = \frac{1}{2} \times \frac{3}{2} = \frac{3}{4} \end{aligned}$$



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]

- Average time would be more than 20*
- The mean could be less than 20 minutes True False
- The mean could be more than 40 minutes True False
If the 3 value ($40 < t \leq 60$) are large enough
- The mean could be less than 40 minutes True False
If the 6 values are small enough
- The range could be more than 40 minutes True False
greatest - smallest
 $60 - 1 = 59$
- The range could be less than 40 minutes True False
 $40 - 20 = 20$
- The range could be more than 60 minutes True False
Not possible as the largest value could be 60 and smallest could be 1
 $\frac{60 - 1}{59}$
can't exceed

7

Turn over ►

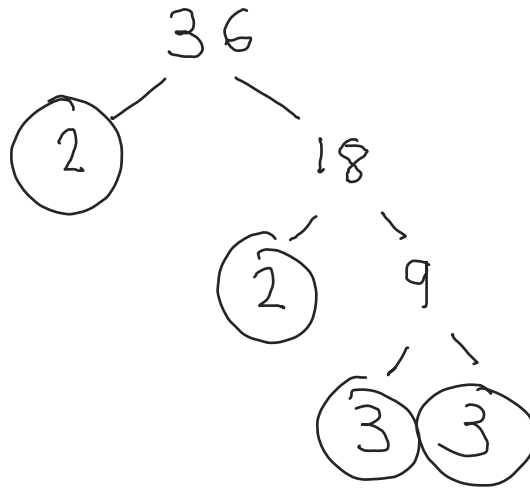


26

Write 36 as a product of prime factors.

Give your answer in index form.

[3 marks]



$$2 \times 2 \times 3 \times 3$$

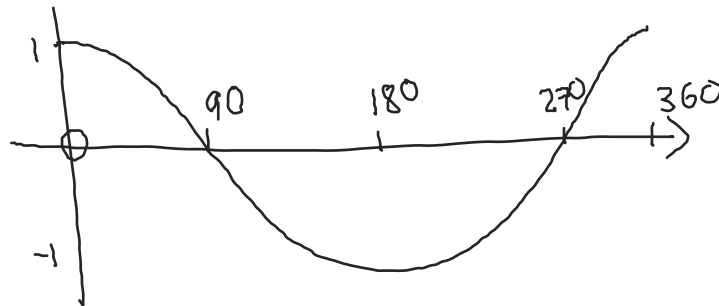
$$\text{Answer} = 2^2 \times 3^2$$

27

Circle the value of $\cos 90^\circ$ — know values

[1 mark]

0 $\frac{1}{2}$ $\frac{\sqrt{3}}{2}$ 1



28

Solve the simultaneous equations.

$$\begin{array}{r} 2x + y = 18 \quad \text{+} \quad \textcircled{1} \\ x - y = 6 \quad \text{+} \quad \textcircled{2} \\ \hline \end{array}$$

[3 marks]

$$3x = 24$$

$$x \div 3 = 8$$

$$\text{sub in } \textcircled{2} : 8 - y = 6$$

$$-y = -2$$

$$y = 2$$

Answer $x = 8, y = 2$

END OF QUESTIONS



There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED**

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