Answer ALL the questions.

Write your answers in the spaces provided.

You must show all of your working.

Leave blank

1 Archie asked some of his friends if they owned a tablet computer.
His results are shown in the tally chart below.

Yes	𝍸 𝍸 ||||
No	𝍸 |

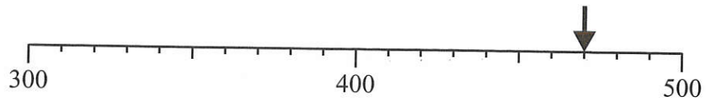
How many said yes?

14

[Total 1 mark]

2 For each of these number lines, write down the number that the arrow is pointing to.

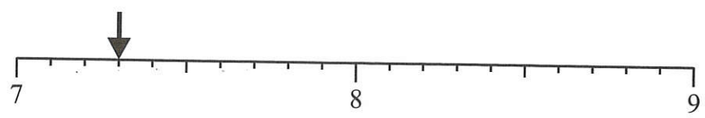
(a)



470

[1]

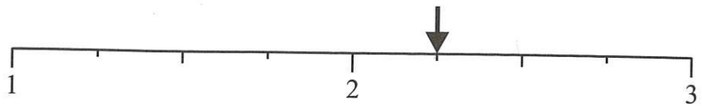
(b)



7.3

[1]

(c)



2.25

[1]

[Total 3 marks]

Leave blank

3 A footballer scores in one out of five matches.
What percentage of the matches does the footballer score in?

$\frac{1}{5} = 0.2 = 20\%$

20 %

[Total 1 mark]

4 A baker designs a pictogram to show how many doughnuts she sold over a bank holiday weekend. She has only completed the pictogram for Saturday.

Saturday	◎ ◎ ◎
Sunday	◎ ◎ ◎ ◎ (1)
Monday	◎ ◎ (1)

Key : ◎ represents 20 doughnuts

The bakery sold 80 doughnuts on Sunday.
Over the three days, the total number of doughnuts sold was 170.

Use this information to complete the pictogram.

170 − 80 − 60 = 30 (1)

[Total 3 marks]

5 Bernie makes a fruit salad. She buys:

1 pineapple that costs 86p
2 oranges that cost 32p each
3 bananas

She pays with a £2 coin and gets 14p change.
Work out the cost of one banana.

2.00 − .14 = £1.86

86 + 32 + 32 = 150 (1)

1

1.86 − 1.50 = 36p (1)

36 ÷ 3 = 12p (1)

12 p

[Total 3 marks]

6 (a) Work out the number of hours in 7 days.

Leave blank

24
×7
168
2

168 ..... hours
[1]

(b) Work out the number of seconds in $2\frac{1}{4}$ minutes.

2×60 = 120
$\frac{1}{4}$×60 = 15 +
135 (1)
(60 ÷ 4) = 15 (1)

135 ..... seconds
[2]

[Total 3 marks]

7 An ice cream company buys a new freezer. It is switched on at 08:30.

During the first five hours after is switched on, the temperature in the freezer drops by the same amount each hour.

Complete the table below.

Time	Temperature (°C)
08:30	18
09:30	11
10:30	4
11:30	−3
12:30	−10
13:30	−17

−7 −7 −7 −7 −7

1 mark for correct table
1 mark for finding the rule

[Total 2 marks]

8 A two-step function machine is shown below.

Leave blank

(a) If the input is 6, what is the output?

6 − 4 = 2
2 × 11 = 22

22 .....
[1]

(b) Write an algebraic expression for the output when the input is x.

11(x − 4). (1)

1 mark for (x − 4)

..... *[2]*

[Total 3 marks]

9 The diagram below shows a quadrilateral.

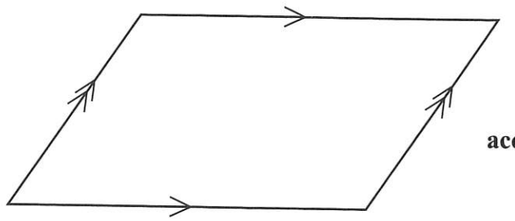


Diagram
accurately drawn

(a) Write down the name of this quadrilateral.

parallelogram

[1]

(b) Describe the symmetry of the shape.
You must refer to both line symmetry and rotational symmetry in your answer.

order rotational symmetry = 2 (1)

line symmetry = 0 (1)

[2]

[Total 3 marks]

Leave blank

10 Given that $p = 3$, $q = 5$ and $r = 7$, work out the value of $2pqr$.

$2 \times 3 \times 5 \times 7$ (1)

$= 210$ (1)

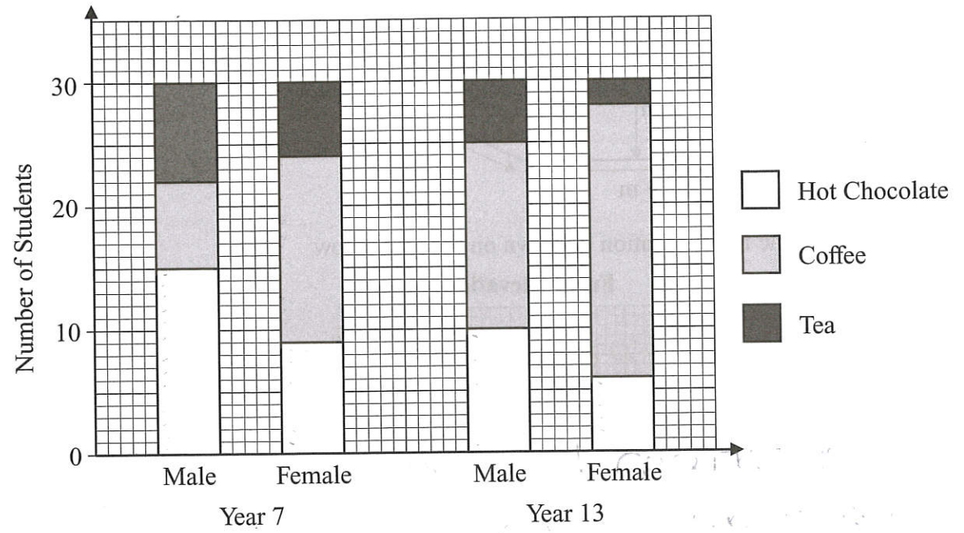
$2 \times 3 = 6$
$6 \times 5 = 30$
$30 \times 7 = 210$

210

[Total 2 marks]

11 Chen asked students in Year 7 and Year 13 to choose their favourite hot drink from hot chocolate, coffee and tea. He asked 30 male and 30 female students from each year.

The results are shown on the stacked bar chart below.



(a) How many female students in Year 7 chose coffee?

15

[1]

(b) How does the total number of Year 7 students who chose tea compare with the total number of students in Year 13 who chose tea?

1 mark for 1 year

Y7 T = 14 Y13 T = 7

Double the number of Y7 students drink tea compare to Y13 (1)

[2]

(c) Chen says, "The ratio of males to females who chose hot chocolate is exactly the same for both year groups."

Show that Chen's statement is correct.

Y7 15 : 9 ← (1) → Y13 : 10 : 6

÷3 ↙ ÷2

5 : 3 ← (1) → 5 : 3

Yes he is correct

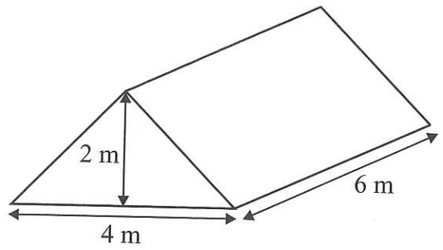
[2]

[Total 5 marks]

Leave blank

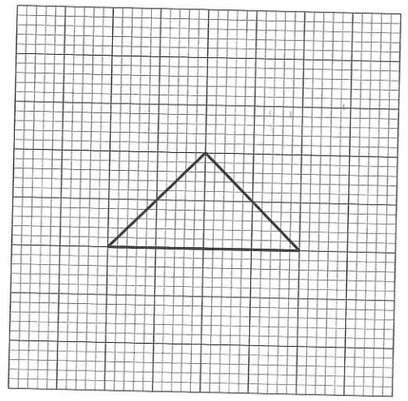
12 The diagram below shows a large tent in the shape of a triangular prism.
The cross-section is an isosceles triangle with a base of 4 m and perpendicular height 2 m.
The prism has a length of 6 m.

Leave blank



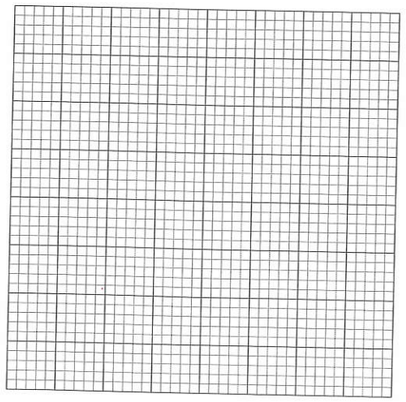
A scale drawing of the front elevation is shown on the grid below.

Front Elevation

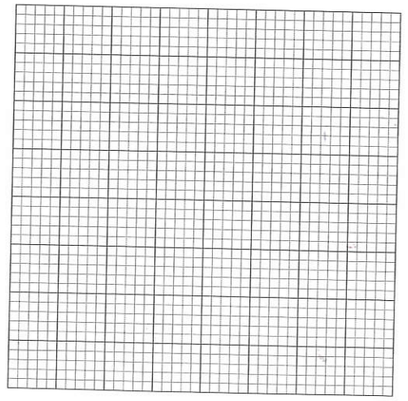


Using the same scale, accurately draw the side elevation and plan view of the tent on the two grids below.

Side Elevation



Plan View



[Total 2 marks]

13 Work out

Leave blank

(a) $\frac{2}{5} + \frac{3}{7}$

$7\times \quad \frac{2}{5} + \frac{3}{7} \times 5 = \frac{14}{35} + \frac{15}{35} =$ (1)

$\frac{29}{35}$ (1)

[2]

(b) $\frac{5}{11} \div \frac{2}{3}$

$\frac{5}{11} \div \frac{2}{3} = \frac{5}{11} \times \frac{3}{2} = \frac{15}{22}$ (1)

$\frac{15}{22}$ (1)

[2]

[Total 4 marks]

14 At a cricket ground, the grass must be cut every week.
One week, it takes 2 groundsmen 180 minutes to cut the grass.

The following week, 8 groundsmen cut the grass. They start at 12:55 pm.
Assuming all the groundsmen work at the same rate, what time will they finish?

180 for 2 groundsmen

for 8 ⇒ 4 times more so $\frac{1}{4}$ of the time (1)

$180 \div 4 = 45$ minutes (1)

$45 = 45$ minutes

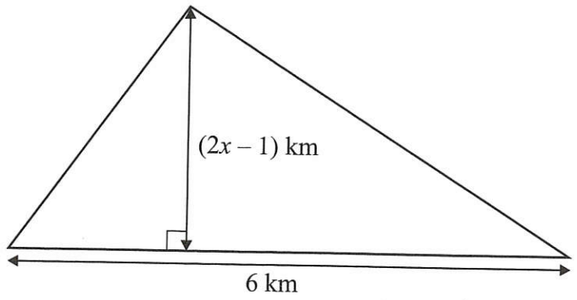
12:55 + :45

1:40pm (1)

[Total 3 marks]

15 An area of land is in the shape of a triangle with a base of length 6 km and a perpendicular height of $(2x - 1)$ km.

Leave blank



(a) Write an expression for the area of the triangle in square kilometres.
Give your answer in its simplest form.

$6x(2x-1) \div 2$ (1)

$= 3(2x-1)$

(1) $3(2x-1)$ or $(6x-3)$ ..... km²

[2]

(b) If the area of the triangle is 15 square kilometres, use your answer to (a) to find the value of x.

$3(2x-1) = 15$ ÷3 ← (1) → or $6x - 3 = 15$ +3

$2x - 1 = 5$ +1

$2x = 6$ ÷2

$x = 3$

$6x = 16$ ÷6

$x = 18$

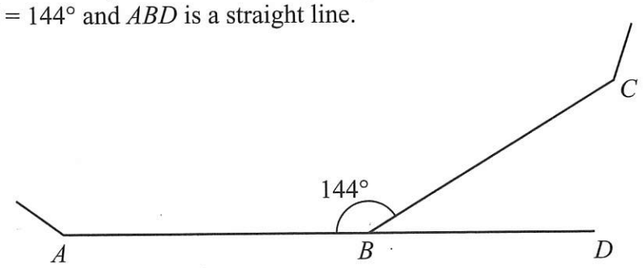
$x =$ 3 (1) .....

[2]

[Total 4 marks]

16 AB and BC are two adjacent sides of a regular polygon.
Angle $ABC = 144°$ and ABD is a straight line.

Leave blank



(a) Work out the size of angle CBD.

$CBD = 180 - 144$

$= 36°$

..... 36 .....°

[1]

(b) Calculate the number of sides of the polygon.

external angles of any polygon = 360°

$360 \div 36 = 10$ (1)

..... 10 (1) .....

[2]

[Total 3 marks]

17 Eve is painting the walls of a room. The walls have an area of 72 m² in total.
To get the colour she wants, she mixes blue and red paint in the ratio 1 : 3.
Both colours of paint are sold in 1.5 litre tins.
One litre of paint will cover an area of 9 m².

Work out the minimum number of tins of each colour she should buy.

$72 \div 9 = 8$ Litres (1)

$1 + 3 = 4$

$8 \div 4 = 2$ Litres / part (1)

2 Litres of Blue & $2 \times 3 = 6$ Litres of red

2 tins = $2 \times 1.5 = 3$ Litres (1)

4 tins = $4 \times 1.5 = 6$ Litres (1)

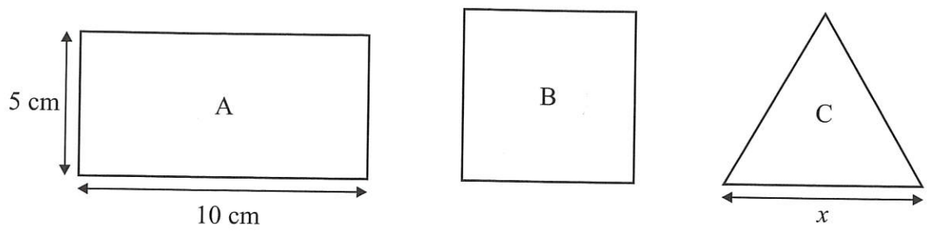
Blue paint: ..... 2 ..... tins

Red paint: ..... 4 ..... tins

[Total 4 marks]

18 Rectangle A has a length of 10 cm and a width of 5 cm.

Leave blank



(a) The perimeter of square B is shorter than the perimeter of rectangle A.
Show that the side length of square B is shorter than 7.5 cm.

Perimeter of A = 5+10+5+10 = 30cm (1)

30 ÷ 4 = 7.5cm (1)

∴ sides must be less than 7.5cm (1)

[3]

(b) Triangle C is equilateral and has side length x cm.
The ratio of the perimeter of rectangle A to the perimeter of triangle C is 5 : 4.
Work out the value of x.

A => 6 6 6 6 6 = 30cm 30 ÷ 5 = 6 (1)

C -> 6 6 6 6 => 4 × 6 = 24cm

3 × x = 24 (1)

x = 24 ÷ 3 = 8 (1)

$x =$ ..... 8 ..... cm
[3]

[Total 6 marks]

19 A biased dice has faces numbered 1 to 6.
The table shows some of the probabilities of rolling each of the numbers.

Leave blank

Number	1	2	3	4	5	6
Probability	0.1 (1)	0.3	0.05	0.2	0.15	0.3

The dice is twice as likely to roll a 2 than a 1.

(a) Complete the table above.

0.3 + 0.15 + 0.2 + 0.05 = 0.70

1 − 0.7 = 0.3 (1)

ratio 1 : 2 ⇒ 1 + 2 = 3

0.3 ÷ 3 = 0.1 *[2]*

(b) What is the probability of rolling a 3 or a 4?

0.05 + 0.2 = 0.25

..... 0.25 .....
[1]

(c) The dice is rolled twice. What is the probability of getting two sixes?

0.3 × 0.3 = 0.09 (1)

..... 0.09 .....
[2]

[Total 5 marks]

20 A cyclist is planning a training session.
She decides to ride for $3\frac{1}{5}$ hours at an average speed of 20 km/h.

Work out the distance that she will cover in km.

D = S × T

= Speed × time

20 × 3 1/5 (1)

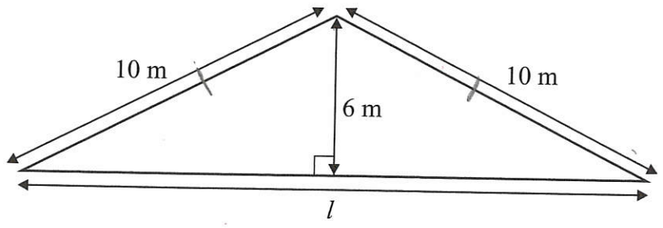
convert to improper fraction $\left(\frac{3\times5+1}{5}\right)$

$= {}^{4}\!\cancel{20} \times \frac{16}{\cancel{8}} = 4 \times 16$

= 64 (1) ..... km

[Total 2 marks]

21 A builder is constructing a roof. The cross-section of the roof has a perpendicular height of 6 m and equal sloping sides of 10 m, as shown below.



Calculate l, the base length of the roof.

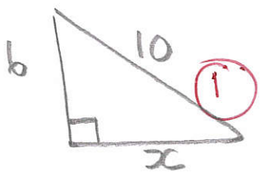
Pythagoras

$a^2 + b^2 = c^2$

$6^2 + b^2 = 10^2$ (1)

$b^2 = 100 - 36$

$b^2 = 64$ $b = 8$ (1)



8 × 2

$l =$ 16 (1) m

[Total 4 marks]

22 **c** and **d** are column vectors such that $\mathbf{c} = \begin{pmatrix} -3 \\ 4 \end{pmatrix}$ and $\mathbf{d} = \begin{pmatrix} 2 \\ 7 \end{pmatrix}$. Calculate:

(a) $-5\mathbf{c}$

$-5 \times \begin{pmatrix} -3 \\ 4 \end{pmatrix} = \begin{pmatrix} -5 \times -3 \\ -5 \times 4 \end{pmatrix} = \begin{pmatrix} 15 \\ -20 \end{pmatrix}$

.....

[1]

(b) $6\mathbf{d} - \mathbf{c}$

$6 \times \begin{pmatrix} 2 \\ 7 \end{pmatrix} - \begin{pmatrix} -3 \\ 4 \end{pmatrix}$

$\begin{pmatrix} 12 \\ 42 \end{pmatrix} - \begin{pmatrix} -3 \\ 4 \end{pmatrix} = \begin{pmatrix} 12 - -3 \\ 42 - 4 \end{pmatrix} = \begin{pmatrix} 15 \\ 38 \end{pmatrix}$ (1) (1)

.....

[2]

[Total 3 marks]

Leave blank

23 The length of a car, c, is measured to the nearest tenth of a metre. The result is 4.8 m.

Find the interval within which c lies. Give your answer as an inequality.

1 mark for correct upper & lower bounds

1 mark for correct inequalities

$4.75 \leqslant c < 4.85$

[Total 2 marks]

24 $\frac{4^7}{4 \times 4^9} = 4^a = \frac{1}{b}$

Find the values of the integers a and b.

$\frac{4^7}{4 \times 4^9} = \frac{4^7}{4^{10}} = 4^{7-10} = 4^{-3}$ so $a = -3$ (1)

(1)

$4^{-3} = \frac{1}{4^3} = \frac{1}{64}$ (1)

$a =$ −3

$b =$ 64

[Total 3 marks]

25 (a) Expand and simplify $(x + 5)(x - 5)$

FOIL

$(x+5)(x-5)$

X	x	$+5$
x	x^2	$+5x$
-5	$-5x$	-25

$x^2 + 5x - 5x - 25$ (1)

$x^2 - 25$ (1)

[2]

Leave blank

(b) (i) Factorise $4x^2 - y^2$

$\Downarrow$

$(2x)^2 - y^2$ (1)

$(2x - y)(2x + y)$ (1)

$(2x-y)(2x+y)$

[2]

(ii) Use your answer to (b) (i) to calculate $4 \times 230^2 - 360^2$

$x = 230$

$y = 360$

$(2 \times 230 - 360) \times (2 \times 230 + 360)$ (1)

$460 - 360 = 100$

100×820

$= 82000$

$460 + 360 = 820$

(1)

82000

[2]

[Total 6 marks]

[TOTAL FOR PAPER = 80 MARKS]

CGP Practice Exam Paper GCSE Mathematics

General Certificate of Secondary Education

GCSE Mathematics (Grade 9-1) Foundation Tier

Centre name					
Centre number					
Candidate number					

Practice Set 1 Paper 1: Non-calculator

Time allowed: 1 hour 30 minutes

Surname
Other names
Candidate signature

In addition to this paper you should have:
- A pen, pencil and eraser.
- A ruler.
- A protractor.
- A pair of compasses.

Calculators may **not** be used.

Instructions to candidates
- Write your name and other details in the spaces provided above.
- Answer all questions in the spaces provided.
- In calculations show clearly how you worked out your answers.
- Diagrams are **not** drawn accurately unless otherwise indicated.

Information for candidates
- There are 80 marks available for this paper.
- The marks available are given in brackets at the end of each question.
- You may get marks for method, even if your answer is incorrect.

Advice to candidates
- Work steadily through the paper.
- Don't spend too long on one question.
- If you have time at the end, go back and check your answers.

For examiner's use			
Q	Mark	Q	Mark
1		14	
2		15	
3		16	
4		17	
5		18	
6		19	
7		20	
8		21	
9		22	
10		23	
11		24	
12		25	
13			
Total			