Full paper C2

Paper 2 style · Calculator · Foundation

80 marks
1 hour 30 minutes

Name	Date	Score / 80

Answer ALL questions. Write your answers in the spaces provided. You must write down all the stages in your working. You may use a calculator. Diagrams are **NOT** accurately drawn unless it says so.

Help on the longer questions

Underlined words tell you what the question wants.

Remember reminds you of a fact you need.

1 **Write** the following numbers in order.
Start with the lowest number.

5 −4 8 1 −2

.....

(1)

(Total for Question 1 is 1 mark)

---

2 **Change** 7000 millilitres to litres.

..... litres

(1)

(Total for Question 2 is 1 mark)

---

3 **Write** $\frac{47}{100}$ as a decimal.

.....

(1)

(Total for Question 3 is 1 mark)

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4 **Write down** the multiple of 8 that is between 50 and 60

.....

(1)

(Total for Question 4 is 1 mark)

Turn over ►

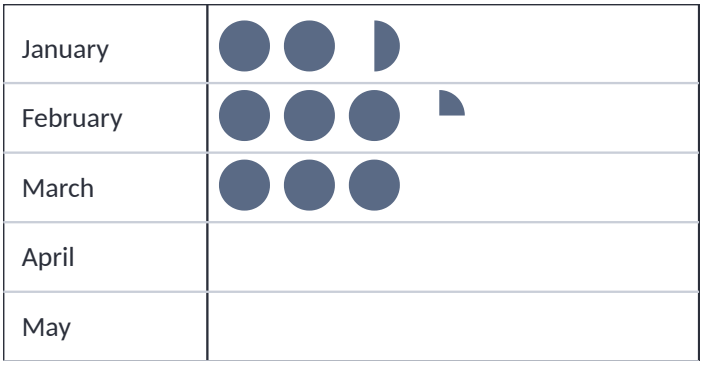
5 **Complete** the statement below to make it correct.

..... × $k = 5k$

(1)

(Total for Question 5 is 1 mark)

6 Zoe sells cars.
The pictogram shows information about the number of cars Zoe sold in each of the first five months of last year.



Key: ● represents 8 cars

Remember Check the key: what does one symbol stand for? A part symbol is a fraction of that.

(a) **Write down** the number of cars Zoe sold in January.

.....

(1)

(b) In April, Zoe sold 14 cars.
Show this information on the pictogram.

(1)

(c) Zoe sold a total of 100 cars in the first five months of last year.
Work out the number of cars Zoe sold in May.

.....

(3)

(Total for Question 6 is 5 marks)

7 ✎ Complete this question on paper (printed at actual size)

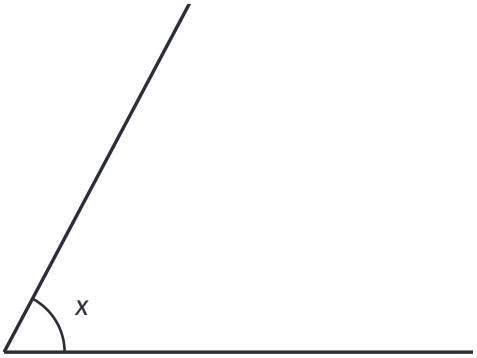
> **Remember** Line up 0 on the ruler. Put the protractor centre on the corner and count from 0°. Acute < 90°, obtuse between 90° and 180°.

(a) **Measure** the length of this line.
Give your answer in centimetres.

..... centimetres

(1)

(b) **Measure** the size of the angle marked *x*.



..... °

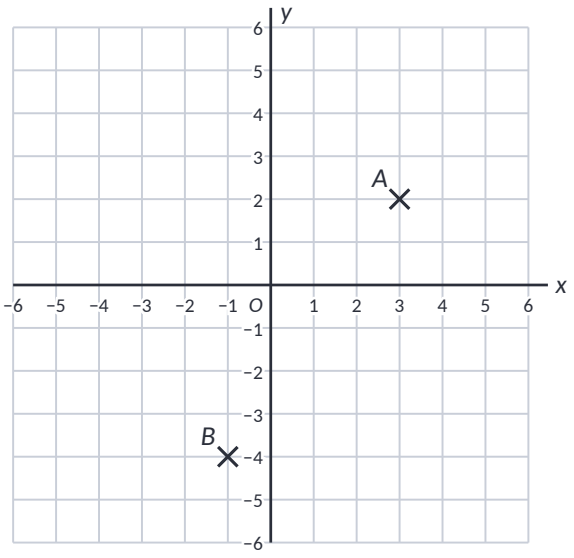
(1)

(c) In the space below, draw a pentagon.

(1)

(Total for Question 7 is 3 marks)

8 The points *A* and *B* are shown on the grid.



Remember (x, y): go along first, then up. Midpoint: add the x values and halve, add the y values and halve.

(a) **Write down** the coordinates of the point *A*.

(1)

(b) **Find** the coordinates of the midpoint of *AB*.

(2)

(c) On the grid, mark with a cross (×) the point with coordinates (−5, 3)
Label this point *C*.

(1)

(Total for Question 8 is 4 marks)

9 Paul has a job as a delivery driver.
He is paid for each mile he drives.
He is also paid expenses.
One week Paul writes down the distance readings from his van.

Start of week:	5	2	3	6	8	**miles**
End of week:	5	2	7	9	5	**miles**

For this week, Paul is paid 45p for each mile he drives.
He is also paid expenses of £65
Work out the total amount that Paul is paid.
Give your answer in pounds.

> **Remember** Units used = end reading − start reading. Then × the cost of each unit. 100p = £1.

£ .....

(4)

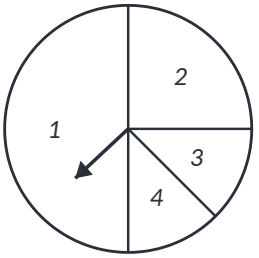
(Total for Question 9 is 4 marks)

10 A spinner can land on red (R) or blue (B).
Kim spins the spinner 3 times.
List all the possible outcomes.

(2)

(Total for Question 10 is 2 marks)

11 Ella has a spinner.



Ella is going to spin the arrow.
The arrow can land on 1 or on 2 or on 3 or on 4
Ella says,

"The probability that the arrow will land on 4 is $\frac{1}{4}$ because the spinner has four sections."

Is Ella correct?
You must give a reason for your answer.

(1)

(Total for Question 11 is 1 mark)

12 Leo buys 30 bottles of drink.
$\frac{3}{5}$ of the 30 bottles are water.
The rest of the 30 bottles are juice.
Each bottle of juice holds 330 millilitres.
Work out the total amount of juice in the bottles that Leo buys.

> **Remember** Fraction of an amount: ÷ by the bottom, × by the top. Percentage: 10% = ÷ 10, 1% = ÷ 100, or use a multiplier (35% = 0.35).

..... millilitres

(3)

(Total for Question 12 is 3 marks)

13

Remember Put the numbers in place of the letters, using brackets for negatives. Then follow BIDMAS.

(a) **Simplify** $4a \times 2b$

.....

(1)

(b) $P = 3x - y$
$x = -2$ and $y = 5$
Work out the value of P.

$P =$ .....

(2)

(Total for Question 13 is 3 marks)

---

14 On Monday, Jack cycled 45 kilometres in 3 hours.

Remember Speed = distance ÷ time. Distance = speed × time. Time = distance ÷ speed. Change minutes to hours: ÷ 60 (30 min = 0.5 h).

(a) **Work out** Jack's average speed.

..... kilometres per hour

(2)

(b) On Tuesday, Jack cycled 45 kilometres at an average speed of 18 kilometres per hour.
Jack says that the total time he cycled on Monday and Tuesday was less than 5 hours 20 minutes.
Is Jack correct?
You must show how you get your answer.

(3)

(Total for Question 14 is 5 marks)

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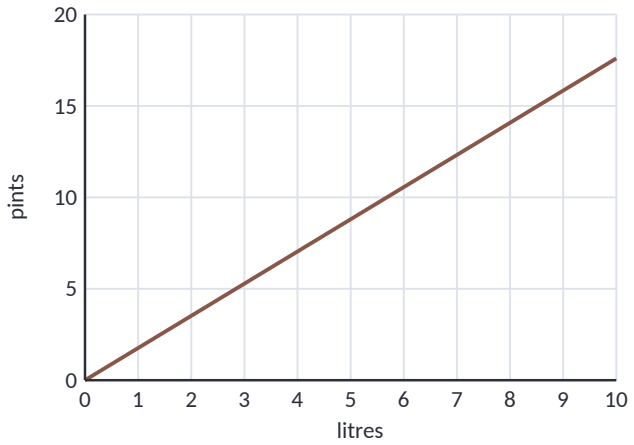
15 £4200 is invested in a bank for 5 years.
The bank pays **simple** interest at a rate of 3.5% per year.
Work out the total amount of simple interest paid.

£ .....

(2)

(Total for Question 15 is 2 marks)

16 You can use this graph to change between litres and pints.



Remember Go across from one axis to the line, then down (or across) to read the other value. For a big value, use a smaller one and multiply.

(a) **Change** 5 litres to pints.

..... pints

(1)

(b) **Change** 30 litres to pints.

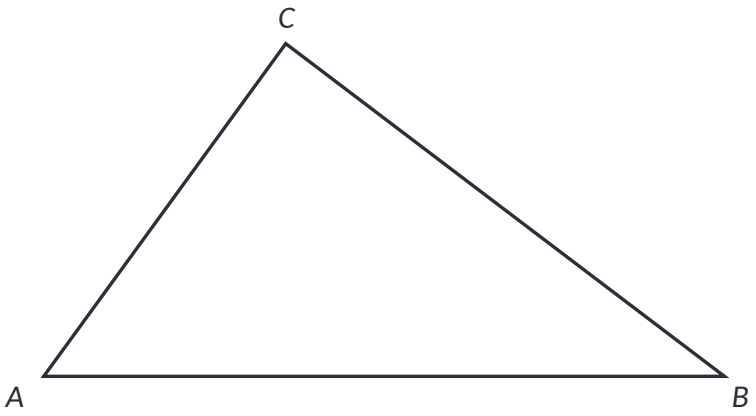
..... pints

(2)

(Total for Question 16 is 3 marks)

17 ✎ Complete this question on paper (printed at actual size)

Here is a triangle *ABC*.



The region **R** consists of all points inside the triangle that are

less than 5 cm from *B*
and closer to *A* than to *C*.

On the diagram show, by shading, the region **R**.

Remember Keep the compasses the same width. Leave all construction arcs showing.

(3)

(Total for Question 17 is 3 marks)

18 Mr Patel organised a school trip for 72 children.
The total cost of the trip was £2160
The school paid 35% of the total cost.
The rest of the total cost was divided equally between the 72 children.
Work out how much money each child paid.

Remember Fraction of an amount: ÷ by the bottom, × by the top. Percentage: 10% = ÷ 10, 1% = ÷ 100, or use a multiplier (35% = 0.35).

£ .....

(3)

(Total for Question 18 is 3 marks)

19

Remember Use brackets for the top and the bottom of a fraction. Write down every digit on the display.

(a) **Work out** the value of

$$\frac{\sqrt{(48.6 + 2.3^3)}}{5.2^2 - 9.47}$$

Write down all the numbers on your calculator display.

.....

(2)

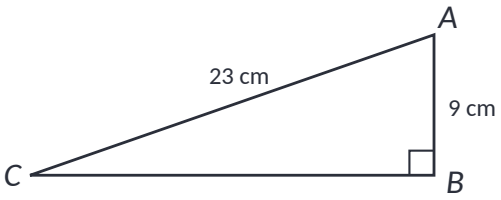
(b) **Write** your answer to part (a) **correct to 2 significant figures**.

.....

(1)

(Total for Question 19 is 3 marks)

20 *ABC* is a right-angled triangle.



Work out the length of *CB*.
Give your answer **correct to 3 significant figures**.

..... cm

(2)

(Total for Question 20 is 2 marks)

21

Remember Use a factor tree. HCF = the primes both numbers share. LCM = the smallest number in both times tables.

(a) **Write** 84 as a product of its prime factors.

.....

(2)

(b) $A = 2^3 \times 5$

$B = 2 \times 5^2$

Write down the lowest common multiple (LCM) of A and B.

.....

(1)

(Total for Question 21 is 3 marks)

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22 The number of hours, H, that some machines take to fill 8000 bottles is given by

$$H = \frac{96}{n}$$ where n is the number of machines.

On Monday, 8 machines filled 8000 bottles.

On Tuesday, 12 machines filled 8000 bottles.

The machines took more time to fill the bottles on Monday than on Tuesday.

How much more time?

..... hours

(2)

(Total for Question 22 is 2 marks)

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23 There are only red counters, blue counters and green counters in a bag.
There are 18 green counters in the bag.
Ravi is going to take at random a counter from the bag.
The probability that the counter will be green is 0.2

the number of red counters : the number of blue counters = 5 : 3

Work out the number of red counters in the bag.

> **Remember** Add the ratio parts to find the total number of parts. One part = amount ÷ total parts. Then multiply.

.....

(4)

(Total for Question 23 is 4 marks)

24

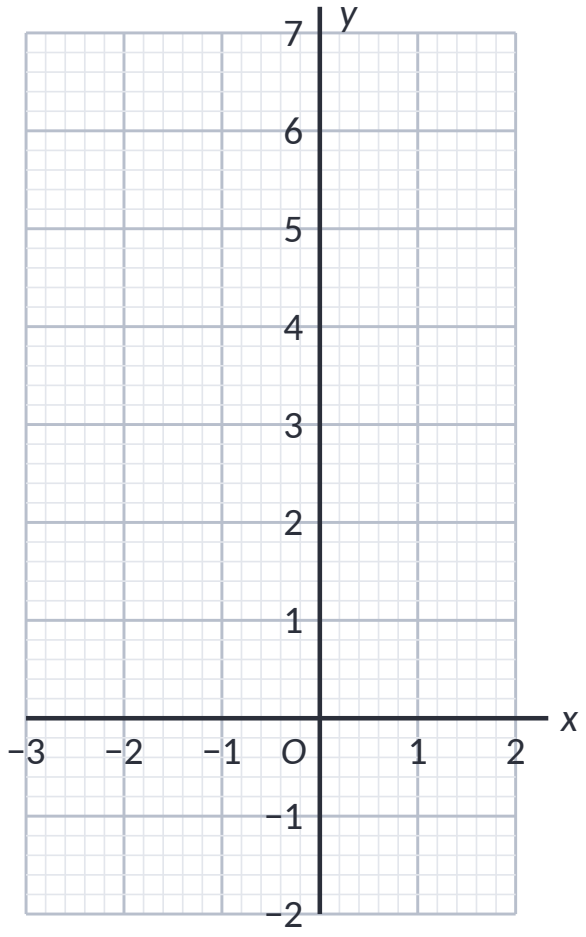
Remember Square first: $(-2)^2 = 4$. Plot each point and join with a smooth curve, not a ruler.

(a) **Complete** the table of values for $y = x^2 + x$

x	−3	−2	−1	0	1	2
y	6			0	2	

(2)

(b) On the grid, draw the graph of $y = x^2 + x$ for values of x from −3 to 2



(2)

(c) **Use your graph** to find estimates for the solutions of the equation $x^2 + x = 3$

.....

(2)

(Total for Question 24 is 6 marks)

25 Amy, Ben and Cara share some sweets in the ratio 1 : 5 : 12

Cara gives $\frac{1}{3}$ of her sweets to Amy.

Cara then gives 25% of the rest of her sweets to Ben.

Cara says,

"Now all three of us have the same number of sweets."

Is Cara correct?

You must show how you get your answer.

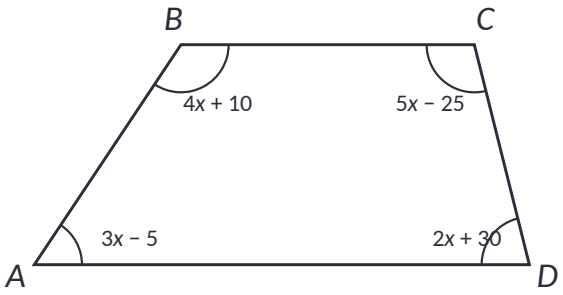
> **Remember** Add the ratio parts to find the total number of parts. One part = amount ÷ total parts. Then multiply.

(4)

(Total for Question 25 is 4 marks)

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26 *ABCD* is a quadrilateral.



All angles are measured in degrees.

Show that *ABCD* is a trapezium.

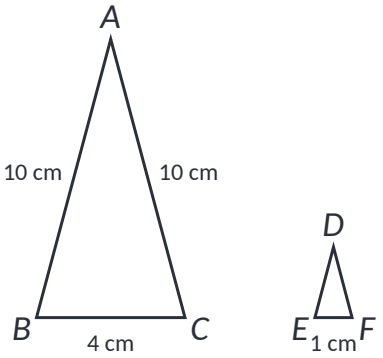
> **Remember** Alternate angles are equal (Z). Corresponding angles are equal (F). Co-interior angles add up to 180° (C). Name the rule you use.

(4)

(Total for Question 26 is 4 marks)

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27 *ABC* and *DEF* are two similar isosceles triangles.



DE = *DF*

Work out the length of *DE*.

..... cm

(2)

(Total for Question 27 is 2 marks)

28 The table shows information about the weights of 120 apples.

Weight (w grams)	Frequency
$40 < w \leqslant 60$	18
$60 < w \leqslant 80$	32
$80 < w \leqslant 100$	41
$100 < w \leqslant 120$	20
$120 < w \leqslant 140$	9

Remember Mean from a table = total of (value × frequency) ÷ total frequency. For groups, use the midpoint of each group.

(a) **Find** the class interval that contains the median.

.....

(1)

(b) **Calculate** an estimate for the mean weight of the 120 apples.
Give your answer **correct to 3 significant figures**.

..... grams

(3)

(Total for Question 28 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS

C2 mark scheme

Q		Answer	Mark	Notes
1		−4, −2, 1, 5, 8	B1	
2		7	B1	
3		0.47	B1	
4		56	B1	
5		5	B1	
6	(a)	20	B1	
	(b)	1¾ circles drawn for April	B1	B1
	(c)	16	M1 M1 A1	M1 for reading 26 and 24 M1 for 100 − (20 + 26 + 24 + 14) A1 cao
7	(a)	7.4	B1	Accept 7.2 to 7.6
	(b)	62	B1	Accept 60 to 64
	(c)	Any 5-sided polygon drawn	B1	B1
8	(a)	(3, 2)	B1	
	(b)	(1, −1)	M1 A1	M1 for one coordinate correct A1 cao
	(c)	Cross at (−5, 3) labelled C	B1	
9		257.15	M1 M1 M1 A1	M1 for 52 795 − 52 368 (= 427) M1 for 427 × 45 (= 19 215p) or 427 × 0.45 (= 192.15) M1 for adding 65 (in pounds) A1 cao
10		RRR, RRB, RBR, BRR, RBB, BRB, BBR, BBB	B2	B2 all 8 with no repeats (B1 for at least 4 correct)

Mark scheme continues ►

Q		Answer	Mark	Notes
11		No: the sections are not the same size, so the outcomes are not equally likely	C1	C1
12		3960	M1 M1 A1	M1 for $\frac{3}{5} \times 30$ (= 18) or $\frac{2}{5} \times 30$ M1 for 12 × 330 A1 cao
13	(a)	$8ab$	B1	
	(b)	−11	M1 A1	M1 for 3 × −2 − 5 A1 cao
14	(a)	15	M1 A1	M1 for 45 ÷ 3 A1 cao
	(b)	No: 3 h + 2 h 30 min = 5 h 30 min, which is more than 5 h 20 min	M1 M1 C1	M1 for 45 ÷ 18 (= 2.5) M1 for 3 + 2.5 (= 5.5 hours) C1 No with 5 h 30 min or 330 minutes
15		735	M1 A1	M1 for 4200 × 0.035 (= 147) A1 cao
16	(a)	8.8	B1	B1 for 8.6 to 9.0
	(b)	52.8	M1 A1	M1 for a correct reading multiplied, e.g. 3 × 17.6 or 6 × 8.8 A1 for 51 to 54
17		Region inside the triangle, inside an arc of radius 5 cm centre B, on the A side of the perpendicular bisector of AC	B1 B1 B1	B1 arc radius 5 cm centre B B1 perpendicular bisector of AC B1 correct region shaded
18		19.50	M1 M1 A1	M1 for 0.35 × 2160 (= 756) or 0.65 × 2160 (= 1404) M1 for 1404 ÷ 72 A1 cao
19	(a)	0.4436721177	M1 A1	M1 for √60.767 or 17.57 A1 for 0.44367...
	(b)	0.44	B1	B1 ft
20		21.2	M1 A1	M1 for $\sqrt{(23^2 - 9^2)}$ A1 for 21.2 (21.16...)

Mark scheme continues ►

Q		Answer	Mark	Notes
21	(a)	$2 \times 2 \times 3 \times 7$	M1 A1	M1 for a factor tree or repeated division A1 for $2^2 \times 3 \times 7$ oe
	(b)	200	B1	B1 for 200 or $2^3 \times 5^2$
22		4	M1 A1	M1 for 96 ÷ 8 (= 12) and 96 ÷ 12 (= 8) A1 cao
23		45	M1 M1 M1 A1	M1 for 18 ÷ 0.2 (= 90) M1 for 90 − 18 (= 72) M1 for 72 ÷ 8 × 5 A1 cao
24	(a)	2, 0, 6	B2	B2 all correct (B1 for 1 or 2 correct)
	(b)	Smooth curve through all 6 points	B2	B2 (B1 for at least 5 points plotted correctly)
	(c)	1.3 and −2.3	M1 A1	M1 for a line $y = 3$ drawn or reading at $y = 3$ A1 for 1.2 to 1.4 and −2.2 to −2.4
25		No: the ratio is now 5 : 7 : 6	M1 M1 M1 C1	M1 for $\frac{1}{3} \times 12$ (= 4) using a number of parts or an amount M1 for 25% of 8 (= 2) M1 for Amy 5, Ben 7, Cara 6 parts C1 No with correct figures
26		$x = 25$, angle $A = 70°$, angle $B = 110°$; $A + B = 180°$ so BC is parallel to AD	M1 A1 M1 C1	M1 for $14x + 10 = 360$ A1 for $x = 25$ M1 for finding at least two angles (70, 110, 100, 80) C1 co-interior angles add up to 180° so a pair of sides is parallel
27		2.5	M1 A1	M1 for 4 ÷ 1 (= 4) or 10 ÷ 4 A1 cao
28	(a)	$80 < w \leqslant 100$	B1	
	(b)	85.0	M1 M1 A1	M1 for using midpoints (50, 70, 90, 110, 130) M1 for 10 200 ÷ 120 A1 for 85.0

B1 = mark for a correct answer · **M1** = method mark · **A1** = accurate answer after M1 · **C1** = reason · **cao** = correct answer only

Score ____ / 80

Write your score on the front page