Full paper A1

Paper 1 style · Non-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 must **not** 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 **Simplify** $m + m + m + m$

.....

(1)

(Total for Question 1 is 1 mark)

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2 **Write** $\frac{2}{5}$ as a decimal.

.....

(1)

(Total for Question 2 is 1 mark)

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3 **Change** 90 millimetres into centimetres.

..... centimetres

(1)

(Total for Question 3 is 1 mark)

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4 **Write down** a multiple of 7 that is between 30 and 40

.....

(1)

(Total for Question 4 is 1 mark)

---

5 Angle P is 128°

What type of angle is angle P?

.....

(1)

(Total for Question 5 is 1 mark)

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6 Ravi works in a café that sells mugs.
The table shows the number of large mugs and the number of small mugs Ravi sold in each of three weeks.

Week	Large mugs	Small mugs
Week 1	26	15
Week 2	34	12
Week 3	19	18

Remember Check the scale on the axis: what does one square stand for? Label bars and use a ruler.

(a) **Work out** the total number of large mugs and small mugs Ravi sold in Week 3.

.....

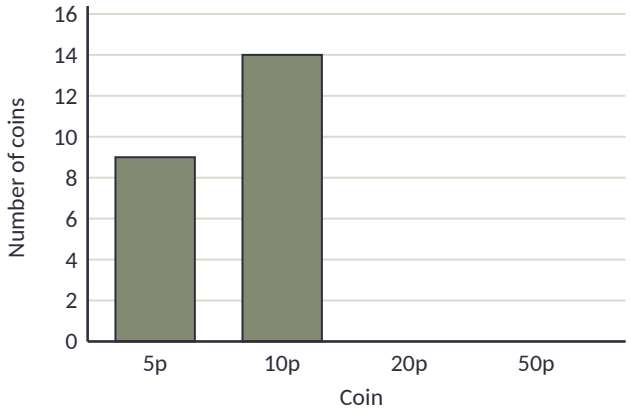
(1)

(b) Ravi says,
"In these three weeks, in total, I sold more than twice as many large mugs as small mugs."
Is Ravi correct?
You must show how you get your answer.

(3)

(Total for Question 6 is 4 marks)

7 There are only 5p coins, 10p coins, 20p coins and 50p coins in a bag.
The bar chart shows information about the number of 5p coins and the number of 10p coins in the bag.



There are six 20p coins in the bag.
There are eleven 50p coins in the bag.

> **Remember** Write down each cost or amount as you work it out, then add them up. Write money with 2 decimal places (£4.50). 100p = £1.

(a) Use this information to complete the bar chart.

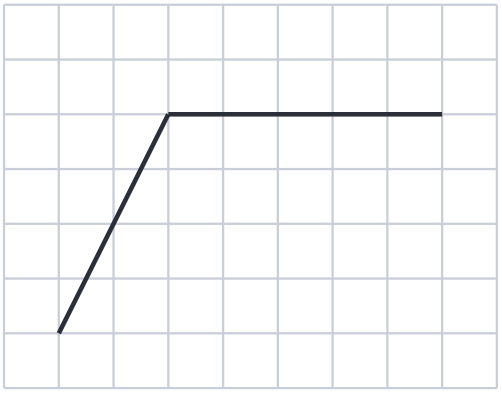
(2)

(b) **Show that** the total amount of money in the bag is more than £8

(3)

(Total for Question 7 is 5 marks)

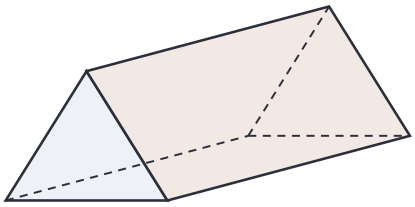
8 The diagram shows two sides of a parallelogram.



(a) On the grid, complete the parallelogram.

(1)

(b) What is the mathematical name of this solid shape?



.....

(1)

(Total for Question 8 is 2 marks)

9 Ana is n years old.
Ana is 3 years younger than Ben.

> **Remember** Collect like terms: the same letter (and power) together. Watch the sign in front of each term.

(a) **Write down** an expression, **in terms of *n***, for Ben's age.

.....

(1)

(b) Ella is three times as old as Ana.
Write down an expression, **in terms of *n***, for Ella's age.

.....

(1)

(c) **Solve** $5w = 35$

$w =$ .....

(1)

(Total for Question 9 is 3 marks)

10

> **Remember** Round every number to 1 significant figure first, then work it out. Say if you rounded up or down.

(a) **Write** 48 372 **to the nearest 100**

.....

(1)

(b) **Work out** an estimate for the value of 7.8×51.4

.....

(2)

(Total for Question 10 is 3 marks)

11

> **Remember** Add/subtract: make the denominators the same. Multiply: top × top, bottom × bottom. Divide: flip the second fraction and multiply. Change mixed numbers to top-heavy first.

(a) **Work out** $\frac{7}{10} - \frac{2}{5}$

.....

(2)

(b) **Work out** $\frac{3}{4}$ of 56

.....

(2)

(Total for Question 11 is 4 marks)

12 Here is part of a bus timetable from Ashby to Kendal.

Ashby	07 15	07 50	08 20
Burton	07 32	08 04	08 38
Carlton	07 58	08 27	09 01
Dalby	08 16	08 49	09 20
Elton	08 35	–	09 42
Kendal	08 54	09 31	10 02

Remember 60 minutes = 1 hour. Count on in steps to the next hour. Read across the row for one bus or train.

(a) Which bus should take the least time to go from Ashby to Carlton?
You must show how you get your answer.

.....

(3)

(b) Mia gets to the bus stop in Elton at 08 30
She wants to catch the next bus to Kendal.
This bus is delayed by 25 minutes.
How many minutes does Mia have to wait for the bus?

..... minutes

(2)

(Total for Question 12 is 5 marks)

13 Here is a function machine.

> **Remember** Go forwards through the machine for the output. To find the input, work backwards using the inverse (× becomes ÷).



(a) **Work out** the output when the input is 5

.....

(1)

(b) **Work out** the input when the output is -19

.....

(2)

(Total for Question 13 is 3 marks)

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14 A footpath has a length of 2.4 kilometres.
The footpath is shown on a map with a scale of 1 : 40 000
Work out the length, in centimetres, of this footpath on the map.

> **Remember** Real distance = map distance × scale. 100 cm = 1 m, 1000 m = 1 km (100 000 cm = 1 km).

..... centimetres

(3)

(Total for Question 14 is 3 marks)

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15 **Work out** 2.65 × 36

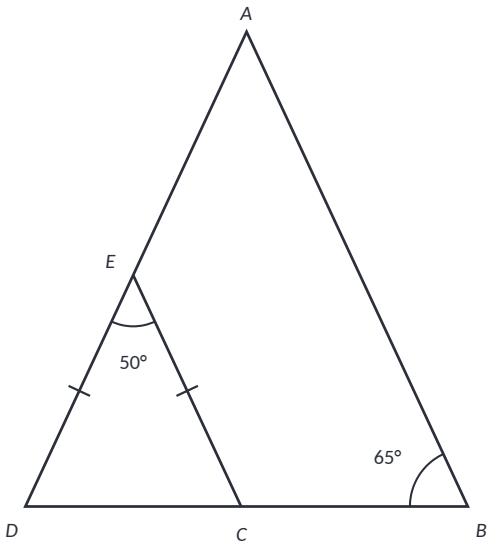
> **Remember** Line up the digits. To divide by a decimal, multiply both numbers by 10 (or 100) first. Check with an estimate.

.....

(3)

(Total for Question 15 is 3 marks)

16



AED and *DCB* are straight lines.

ED = *EC*

Show that *EC* is parallel to *AB*.

Give a reason for each stage of your working.

> **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 16 is 4 marks)

17 Leah wants to use this recipe to make 18 muffins.

Ingredients for 12 muffins
240 g flour
150 m*l* milk
90 g sugar
2 eggs

Leah has

400 g flour
200 m*l* milk
140 g sugar
4 eggs

Does Leah have enough flour, enough milk, enough sugar and enough eggs to make 18 muffins?
You must show all your working.

Remember Find the value for 1 first (÷), then multiply. Inverse proportion: more workers → less time (× then ÷).

(3)

(Total for Question 17 is 3 marks)

18 Here are the times, in seconds, of 12 runners.

58	63	71	49	66	75
52	68	61	57	70	64

Show this information in a stem and leaf diagram.



Key:

Remember Put the leaves in order and always write a key. Median = the middle value; range = biggest − smallest.

(3)

(Total for Question 18 is 3 marks)

19 **Find** the highest common factor (HCF) of 72 and 90

.....

(2)

(Total for Question 19 is 2 marks)

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20 There are only lemon sweets, orange sweets, lime sweets and cherry sweets in a bag.
Zara is going to take at random a sweet from the bag.
The table shows the probability that she will take a lemon sweet and the probability that she will take an orange sweet.

Flavour	lemon	orange	lime	cherry
Probability	0.25	0.15		

There are three times as many lime sweets as there are cherry sweets in the bag.

> **Remember** Probabilities add up to 1. P(event) = number of ways it can happen ÷ total number of outcomes. AND means multiply.

(a) **Work out** the probability that Zara will take a lime sweet.

.....

(3)

(b) There are 30 orange sweets in the bag.
Work out the total number of sweets in the bag.

.....

(2)

(Total for Question 20 is 5 marks)

21

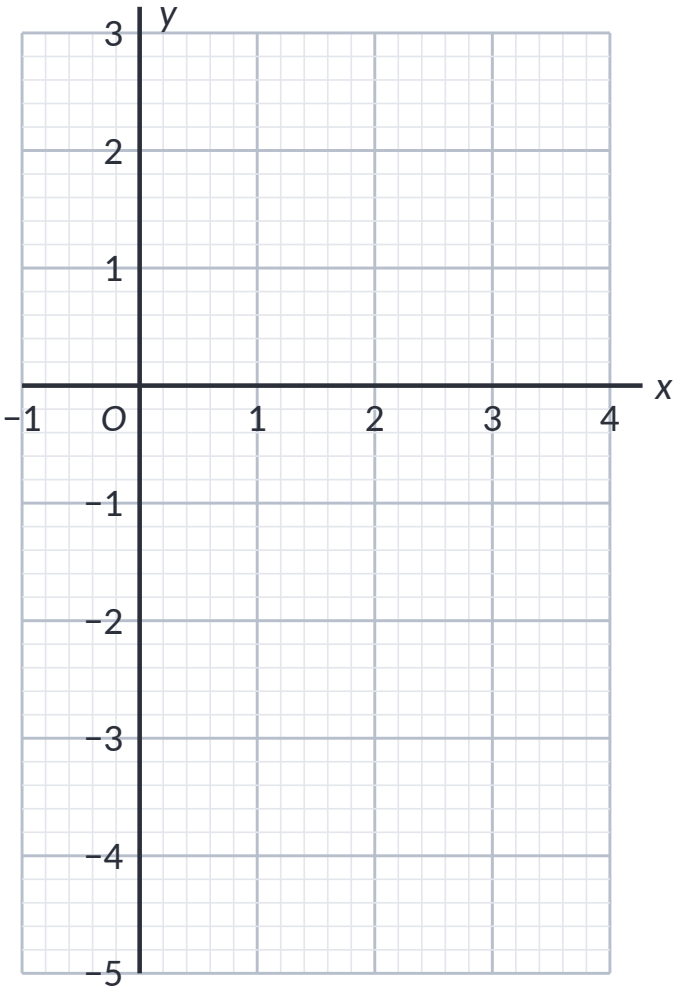
Remember Square first: $(-2)^2 = 4$. Plot each point and join with a smooth curve, not a ruler.

(a) **Complete** the table of values for $y = x^2 - 3x - 2$

x	−1	0	1	2	3	4
y	2		−4			

(2)

(b) On the grid, draw the graph of $y = x^2 - 3x - 2$ for values of x from −1 to 4



(2)

(c) **Write down** the coordinates of the turning point of the graph of $y = x^2 - 3x - 2$

(1)

(Total for Question 21 is 5 marks)

22 There are 360 buttons in a tin.
There are only red buttons, blue buttons and yellow buttons.
$\frac{1}{8}$ of the 360 buttons are red.
The number of blue buttons : the number of yellow buttons = 2 : 3
The number of yellow buttons : the number of red buttons = n : 1

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

(a) **Work out** the value of n.
You must show all your working.

n = ...

(5)

(b) 12 blue buttons are lost.
Does this affect your answer to part (a)?
Give a reason for your answer.

(1)

(Total for Question 22 is 6 marks)

23 **Work out** $4.6 \times 10^3 + 8.5 \times 10^2$
Give your answer in standard form.

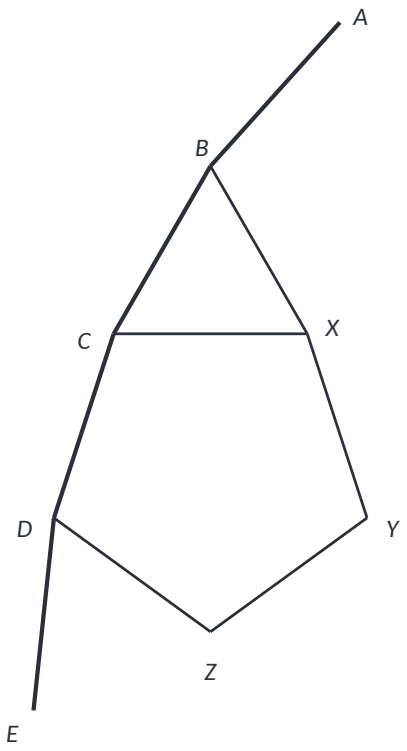
> **Remember** $A \times 10^n$ where A is between 1 and 10. Big numbers: positive power. Small numbers: negative power.

.....

(3)

(Total for Question 23 is 3 marks)

24 *AB*, *BC*, *CD* and *DE* are four sides of a regular polygon with *n* sides.



BCX is an equilateral triangle.
CXYZD is a regular pentagon.
Work out the value of *n*.
You must show all your working.

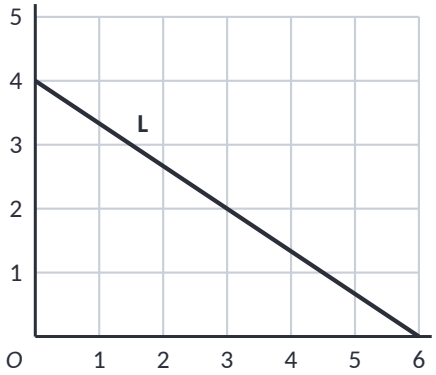
> **Remember** Sum of interior angles = (n − 2) × 180°. Exterior angles add up to 360°. Interior + exterior = 180°.

n = ...

(4)

(Total for Question 24 is 4 marks)

25 The straight line **L** is shown on the grid.



Find an equation for **L**.
Give your answer in the form $y = mx + c$

> **Remember** y = mx + c: m is the gradient (up ÷ across), c is where the line crosses the y-axis.

.....

(3)

(Total for Question 25 is 3 marks)

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26 $\mathbf{a} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 5 \\ 1 \end{pmatrix}$

Work out $3\mathbf{a} + 2\mathbf{b}$

Give your answer **as a column vector**.

$\begin{pmatrix} ..... \\ ..... \end{pmatrix}$

(2)

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

A1 mark scheme

Q		Answer	Mark	Notes
1		$4m$	B1	Accept $4 \times m$
2		0.4	B1	
3		9	B1	
4		35	B1	35 is the only one
5		obtuse	B1	
6	(a)	37	B1	19 + 18
	(b)	No, with 79 and 90 (or 2×45)	M1 M1 C1	M1 for 26 + 34 + 19 (= 79) or 15 + 12 + 18 (= 45) M1 for 2×45 (= 90) or $79 \div 45$ C1 No, with 79 and 90 (or 1.75…)
7	(a)	Bars drawn at 6 (20p) and 11 (50p)	B1 B1	B1 for one bar correct B1 for both bars correct, same width
	(b)	£8.55 (855p), which is more than £8	M1 M1 C1	M1 for one of 9×5 (= 45), 14×10 (= 140), 6×20 (= 120), 11×50 (= 550) M1 for adding all four C1 for 855p or £8.55 and a conclusion
8	(a)	Fourth corner 5 squares to the right of the bottom end, joined to both ends	B1	Vertex at (6, 1) if the bottom-left of the grid is (0, 0)
	(b)	triangular prism	B1	
9	(a)	$n + 3$	B1	
	(b)	$3n$	B1	Accept $3 \times n$
	(c)	7	B1	

Mark scheme continues ►

Q		Answer	Mark	Notes
10	(a)	48 400	B1	
	(b)	400	M1 A1	M1 for 8 × 50 A1 for 400
11	(a)	$\frac{3}{10}$	M1 A1	M1 for $\frac{4}{10}$ seen A1 for $\frac{3}{10}$ oe
	(b)	42	M1 A1	M1 for 56 ÷ 4 (= 14) A1 cao
12	(a)	The 07 50 bus (37 minutes)	M1 M1 A1	M1 for one of 43, 37, 41 minutes M1 for all three A1 07 50 with 37
	(b)	30	M1 A1	M1 for 08 35 + 25 min (= 09 00) or 5 + 25 A1 cao
13	(a)	13	B1	5 × 4 = 20, then − 7 = 13
	(b)	-3	M1 A1	M1 for working backwards: -19 + 7 (= -12), then ÷ 4 A1 cao
14		6	M1 M1 A1	M1 for 2.4 km = 240 000 cm M1 for 240 000 ÷ 40 000 A1 cao
15		95.4	M1 M1 A1	M1 for a complete method, e.g. 265 × 36 = 9540 M1 for placing the decimal point A1 cao
16		Angle *ECD* = 65° = angle *ABD*, so *EC* is parallel to *AB*	M1 A1 C1 C1	M1 for (180 − 50) ÷ 2 A1 for angle *EDC* or *ECD* = 65° C1 base angles of an isosceles triangle are equal and angles in a triangle add up to 180° C1 corresponding angles are equal (so the lines are parallel)
17		No, she does not have enough milk (she needs 225 m*l*)	M1 M1 C1	M1 for a scale factor of 1.5 (18 ÷ 12) or amounts for 6 muffins M1 for 360, 225, 135 and 3 C1 not enough milk
18		4 | 9 5 | 2 7 8 6 | 1 3 4 6 8 7 | 0 1 5 Key: 4 | 9 = 49 seconds	B2 B1	B2 fully correct and ordered (B1 for unordered, or one error) B1 a correct key

Mark scheme continues ►

Q		Answer	Mark	Notes
19		18	M1 A1	M1 for prime factors 2 × 2 × 2 × 3 × 3 and 2 × 3 × 3 × 5, or listing factors A1 cao
20	(a)	0.45	M1 M1 A1	M1 for 1 − (0.25 + 0.15) (= 0.6) M1 for 0.6 ÷ 4 (= 0.15) A1 0.45 oe
	(b)	200	M1 A1	M1 for 30 ÷ 0.15 A1 cao
21	(a)	−1 → 2, 0 → −2, 1 → −4, 2 → −4, 3 → −2, 4 → 2	B2	B2 all correct (B1 for 2 or 3 correct)
	(b)	Smooth U-shaped curve through all the points	M1 A1	M1 for at least 5 points plotted correctly A1 smooth curve
	(c)	(1.5, −4.25)	B1	Accept (1.5, between −4.3 and −4.2)
22	(a)	4.2	M1 M1 M1 M1 A1	M1 for 360 ÷ 8 (= 45) M1 for 360 − 45 (= 315) M1 for 315 ÷ 5 (= 63) M1 for 63 × 3 (= 189) A1 for 4.2 oe
	(b)	No, because *n* only uses the yellow and red buttons	C1	C1
23		5.45×10^3	M1 M1 A1	M1 for 4600 or 850 M1 for 5450 A1 cao
24		30	M1 M1 M1 A1	M1 for the interior angle of a pentagon, (5 − 2) × 180 ÷ 5 (= 108) M1 for 60 + 108 (= 168) M1 for 360 ÷ (180 − 168) A1 cao
25		$y = -\frac{2}{3}x + 4$	M1 M1 A1	M1 for the gradient, e.g. −4 ÷ 6 M1 for $c = 4$ or $y = mx + 4$ A1 oe
26		$\begin{pmatrix} 19 \\ -4 \end{pmatrix}$	M1 A1	M1 for $\begin{pmatrix} 9 \\ -6 \end{pmatrix}$ or $\begin{pmatrix} 10 \\ 2 \end{pmatrix}$ A1 cao

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

Score ____ / 80