Full paper F1

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 **Write** 0.9 as a fraction.

.....

(1)

(Total for Question 1 is 1 mark)

---

2 **Work out** 4^3

.....

(1)

(Total for Question 2 is 1 mark)

---

3 **Work out** $30 \div (4 + 2)$

.....

(1)

(Total for Question 3 is 1 mark)

---

4 **Write down** a factor of 48 that is between 10 and 15

.....

(1)

(Total for Question 4 is 1 mark)

---

5 **Simplify** $2 \times a \times 6 \times b$

.....

(1)

(Total for Question 5 is 1 mark)

Turn over ►

6 Jack is planning a trip to a zoo for 2 adults and 1 child.
These are the costs for the trip.

Total cost of petrol	£18
Tickets to the zoo	£28 each adult £19.50 each child
Meals	£12 each adult £8 each child

Jack has £150 to spend.
He pays all the costs.
How much money does he have left?

> **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.

£ .....

(4)

(Total for Question 6 is 4 marks)

7 Here is a list of 8 letters.

X Y X Z X X Y X

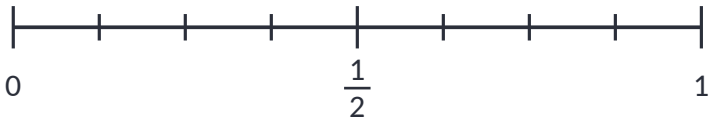
> **Remember** Probabilities add up to 1. P(event) = number of ways it can happen ÷ total number of outcomes. AND means multiply.

(a) **Write down** the mode.

.....

(1)

(b) One of the 8 letters is going to be picked at random.
On the probability scale, mark with a cross (×) the probability that this letter will be Y.



(1)

(c) **Find** the probability that this letter will be Z.

.....

(1)

(Total for Question 7 is 3 marks)

8

Remember Do the same to both sides. Undo + with −, undo × with ÷. Expand brackets first.

(a) **Solve** $p + 5 = 12$

$p =$ .....

(1)

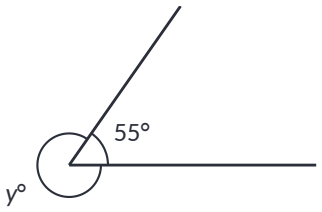
(b) **Solve** $4n + n = 30$

$n =$ .....

(2)

(Total for Question 8 is 3 marks)

9



(a) **Find** the value of y.

$y =$ .....

(1)

(b) **Give a reason for your answer**.

(1)

(Total for Question 9 is 2 marks)

10 A shop sells tins of paint.
Each tin of paint costs £6
Ryan has £40

> **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) **Work out** the greatest number of tins of paint Ryan can buy.

.....

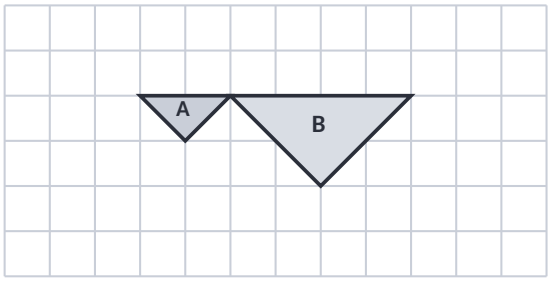
(2)

(b) In a sale on Saturday, tins of paint are sold at half price.
Ryan thinks that the greatest number of tins of paint he can now buy for £40 is exactly twice his answer to part (a)
Is Ryan correct?
You must give a reason for your answer.

(1)

(Total for Question 10 is 3 marks)

11 Here are two triangles on a grid.



Triangle **B** is an enlargement of triangle **A**.

> **Remember** Multiply every length by the scale factor. Draw lines from the centre through each corner.

(a) **Write down** the scale factor of the enlargement.

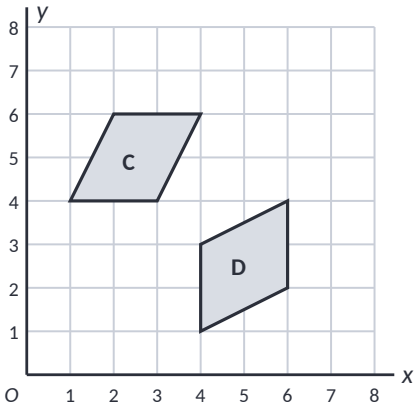
.....

(1)

(b) On the grid, mark with a cross (×) the centre of enlargement.

(1)

(c) Here are two parallelograms on a coordinate grid.



Parallelogram **D** is a reflection of parallelogram **C**.
On the grid, draw the mirror line.

(1)

(d) **Write down** an equation of this mirror line.

.....

(1)

(Total for Question 11 is 4 marks)

12 Grace spent 150 minutes at a leisure centre.
She swam for 45 minutes.
She used the gym for $\frac{1}{5}$ of the 150 minutes.
She used the sauna for 10% of the 150 minutes.
She then spent the rest of the 150 minutes in the café.

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

(a) **Work out** the total time, in minutes, that Grace spent in the café.

..... minutes

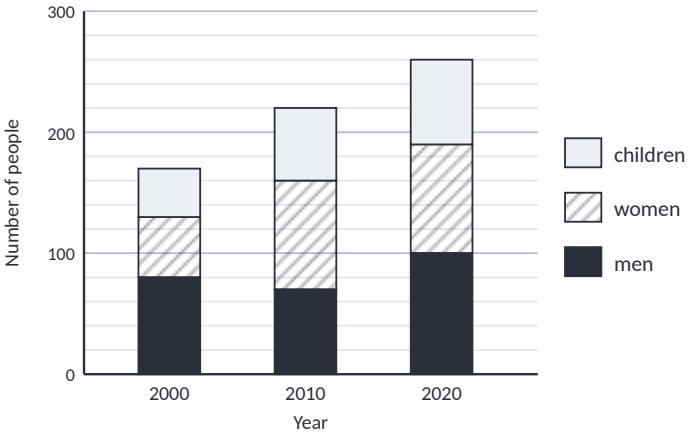
(4)

(b) Grace got to the leisure centre at 2 pm.
She had asked her friend to meet her in the café at 4 pm.
Did Grace get to the café by 4 pm?
Give a reason for your answer.

(1)

(Total for Question 12 is 5 marks)

13 The composite bar chart shows information about the number of people living in a village.



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

(a) **Write down** the number of men living in the village in the year 2000

.....

(1)

(b) **Find** the number of children living in the village in the year 2010

.....

(1)

(c) For the people living in the village in the year 2020
find the ratio of the number of children to the **total** number of men and women.

.....

(2)

(Total for Question 13 is 4 marks)

14 Ruby drives from Leeds to York at an average speed of 48 miles per hour.

She drives for $2\frac{1}{4}$ hours.

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

(a) **Work out** the distance from Leeds to York.

..... miles

(2)

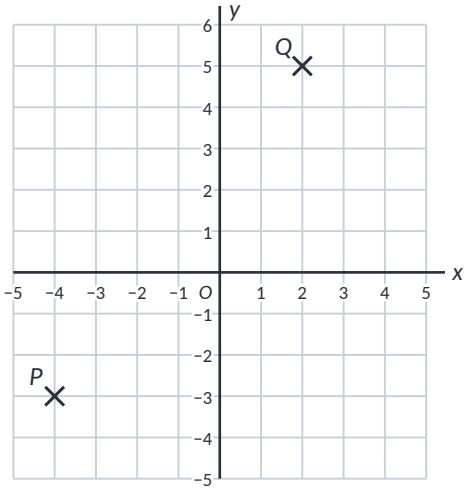
(b) Kai is using a map.
The map has a scale of 1 : 50 000
On the map a path has a length of 7 cm.
Work out the length, in kilometres, of the real path.

..... kilometres

(3)

(Total for Question 14 is 5 marks)

15



Find the coordinates of the midpoint of PQ.

(2)

(Total for Question 15 is 2 marks)

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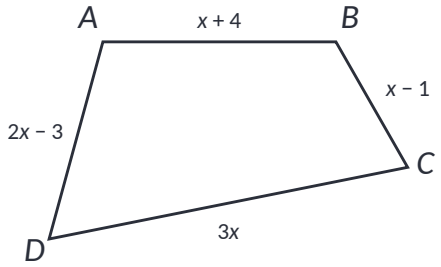
16 Here is a quadrilateral *ABCD*.



All the measurements are in centimetres.
The perimeter of *ABCD* is 56 centimetres.
Work out the length of *DC*.

> **Remember** Do the same to both sides. Undo + with −, undo × with ÷. Expand brackets first.

..... centimetres

(4)

(Total for Question 16 is 4 marks)

17 There are only blue counters, green counters, red counters and yellow counters in a bag.
The table shows the number of blue counters in the bag.

Colour	blue	green	red	yellow
Number of counters	24			

There is a total of 75 counters in the bag.

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

(a) Leo takes at random a counter from the bag.
Find the probability that the counter is **not** blue.

.....

(2)

(b) The ratio of the number of blue counters to the number of green counters is 3 : 5
Work out the number of green counters in the bag.

.....

(2)

(c) Ella says,

> "The number of red counters in the bag is the same as the number of yellow counters in the bag."

Can Ella be correct?
Give a reason for your answer.

(1)

(Total for Question 17 is 5 marks)

18 There are 360 cans of drink on a shelf.
Each can contains juice or water or milk.

number of cans of juice : number of cans of water : number of cans of milk = 4 : 3 : 2

$\frac{1}{4}$ of the cans of water and $\frac{1}{8}$ of the cans of milk are removed from the shelf.

Work out the number of cans of juice as a percentage of the total number of cans of drink remaining on the shelf.

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

..... %

(5)

(Total for Question 18 is 5 marks)

---

19 **Write** 360 as a product of powers of its prime factors.

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

.....

(3)

(Total for Question 19 is 3 marks)

20

> **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** $2\frac{2}{5} + 1\frac{3}{4}$

Give your answer **as a mixed number**.

.....

(2)

(b) **Show that** $3\frac{1}{3} \div 5 = \frac{2}{3}$

(2)

(Total for Question 20 is 4 marks)

---

21 **Simplify** $(3^{-4} \times 3^{7})^{2}$

Give your answer **as a power of 3**

.....

(2)

(Total for Question 21 is 2 marks)

22 **Work out** 0.006×0.41

.....

(2)

(Total for Question 22 is 2 marks)

23 A company is going to make four different phone models **A**, **B**, **C** and **D**.

120 people are asked which of the four models they would be most likely to buy.

The table shows information about the results.

Phone model	Number of people
A	30
B	18
C	42
D	30

The company is going to make 60 000 phones next year.

Work out how many model **B** phones the company should make next year.

.....

(2)

(Total for Question 23 is 2 marks)

24 Priya writes down three numbers a, b and c

$a : b = 2 : 5$
$b : c = 3 : 4$

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

(a) **Find** $a : b : c$

.....

(2)

(b) **Express** a as a fraction of the total of the three numbers a, b and c

.....

(2)

(c) Sam writes down three numbers m, n and p

$n = 3m$
$p = 4n$

Find $m : p$

.....

(2)

(Total for Question 24 is 6 marks)

25

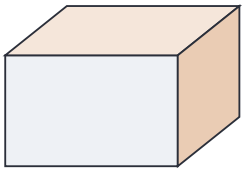


Diagram NOT accurately drawn

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

A storage tank exerts a force of 18 000 newtons on the ground.
The base of the tank in contact with the ground is a 3 m by 2 m rectangle.
Work out the pressure on the ground due to the tank.

..... newtons/m^2

(2)

(Total for Question 25 is 2 marks)

26

Remember Expand: multiply every term inside the bracket. Factorise: take out the highest common factor. Quadratics: two numbers that multiply to the last term and add to the middle.

(a) **Solve** $\frac{3x}{4} - 2 > 7$

.....

(3)

(b) **Factorise** $x^2 + 8x + 15$

.....

(2)

(Total for Question 26 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

F1 mark scheme

Q		Answer	Mark	Notes
1		$\frac{9}{10}$	B1	
2		64	B1	
3		5	B1	
4		12	B1	
5		$12ab$	B1	
6		24.50	M1 M1 M1 A1	M1 for 2 × 28 + 19.50 (= 75.50) M1 for 2 × 12 + 8 (= 32) M1 for 150 − (18 + 75.50 + 32) A1 cao
7	(a)	X	B1	
	(b)	Cross at $\frac{2}{8}$	B1	
	(c)	$\frac{1}{8}$	B1	
8	(a)	7	B1	
	(b)	6	M1 A1	M1 for $5n = 30$ A1 cao
9	(a)	305	B1	
	(b)	Angles around a point add up to 360°	C1	C1
10	(a)	6	M1 A1	M1 for 40 ÷ 6 A1 cao
	(b)	No: he can buy 13 tins, which is more than twice 6	C1	C1

Mark scheme continues ►

Q		Answer	Mark	Notes
11	(a)	**2**	**B1**	
	(b)	**Cross at the point 1 square right of the left edge, 4 squares up (where lines through corresponding vertices meet)**	**B1**	B1
	(c)	**Line $y = x$ drawn**	**B1**	B1
	(d)	**$y = x$**	**B1**	
12	(a)	**60**	**M1** **M1** **M1** **A1**	M1 for $\frac{1}{5} \times 150$ (= 30) M1 for 10% of 150 (= 15) M1 for 150 − (45 + 30 + 15) A1 cao
	(b)	**Yes: she got to the café at 3.30 pm (2 pm + 90 minutes)**	**C1**	C1 ft
13	(a)	**80**	**B1**	
	(b)	**60**	**B1**	
	(c)	**7 : 19**	**M1** **A1**	M1 for 70 : 190 A1 cao
14	(a)	**108**	**M1** **A1**	M1 for $48 \times 2\frac{1}{4}$ A1 cao
	(b)	**3.5**	**M1** **M1** **A1**	M1 for 7 × 50 000 (= 350 000 cm) M1 for ÷ 100 000 A1 cao
15		**(−1, 1)**	**M1** **A1**	M1 for one coordinate correct A1 cao
16		**24**	**M1** **M1** **A1** **A1**	M1 for $x + 4 + x - 1 + 3x + 2x - 3$ (= 7x) M1 for $7x = 56$ A1 for $x = 8$ A1 for 24

Mark scheme continues ►

Q		Answer	Mark	Notes
17	(a)	$\frac{51}{75}$	M1 A1	M1 for 75 − 24 (= 51) A1 oe
	(b)	40	M1 A1	M1 for 24 ÷ 3 (= 8) A1 cao
	(c)	No: there are 11 red and yellow counters, an odd number, so they cannot be split equally	C1	C1
18		50	M1 M1 M1 M1 A1	M1 for 360 ÷ 9 (= 40) M1 for 160, 120 and 80 M1 for 30 and 10 removed M1 for 160 ÷ 320 × 100 A1 cao
19		$2^3 \times 3^2 \times 5$	M1 M1 A1	M1 for at least two correct steps in a factor tree or repeated division M1 for 2, 2, 2, 3, 3, 5 A1 cao
20	(a)	$4\frac{3}{20}$	M1 A1	M1 for a common denominator of 20 A1 cao
	(b)	$\frac{10}{3} \times \frac{1}{5} = \frac{10}{15} = \frac{2}{3}$	M1 A1	M1 for $\frac{10}{3} \times \frac{1}{5}$ A1 for $\frac{10}{15}$ and $\frac{2}{3}$
21		3^6	M1 A1	M1 for 3^3 or $3^{-8} \times 3^{14}$ A1 cao
22		0.00246	M1 A1	M1 for 6 × 41 = 246 A1 cao
23		9000	M1 A1	M1 for $\frac{18}{120} \times 60\,000$ A1 cao
24	(a)	6 : 15 : 20	M1 A1	M1 for making *b* the same (15) A1 cao
	(b)	$\frac{6}{41}$	M1 A1	M1 for 6 + 15 + 20 (= 41) A1 ft
	(c)	1 : 12	M1 A1	M1 for $p = 12m$ A1 cao
25		3000	M1 A1	M1 for 18 000 ÷ (3 × 2) A1 cao

Mark scheme continues ►

Q		Answer	Mark	Notes
26	(a)	$x > 12$	M1 M1 A1	M1 for $\frac{3x}{4} > 9$ M1 for $3x > 36$ A1 cao
	(b)	$(x + 3)(x + 5)$	M1 A1	M1 for $(x \pm 3)(x \pm 5)$ A1 cao

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

Score ____ / 80