Full paper E1

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** 46% as a decimal.

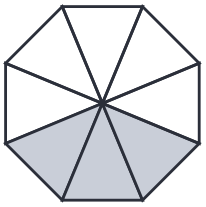
.....

(1)

(Total for Question 1 is 1 mark)

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2 What fraction of this shape is shaded?



.....

(1)

(Total for Question 2 is 1 mark)

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3 Here is a list of numbers.

2.4 2.7 1.9 0.8 1.2

From the list, write down the largest number.

.....

(1)

(Total for Question 3 is 1 mark)

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4 **Work out** −7 + 3

.....

(1)

(Total for Question 4 is 1 mark)

Turn over ►

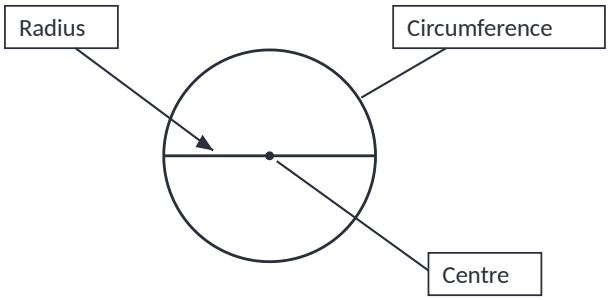
5 **Solve** $q + 4 = 11$

$q =$ .....

(1)

(Total for Question 5 is 1 mark)

6 Leon adds labels to this diagram of a circle.



Explain why one of the labels is wrong.

(1)

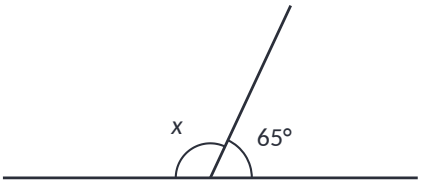
(Total for Question 6 is 1 mark)

7 **Write down three** different factors of 30

(2)

(Total for Question 7 is 2 marks)

8



Remember Straight line = 180°. Around a point = 360°. Triangle = 180°. Quadrilateral = 360°. Isosceles: two equal base angles. Write the reason for each angle.

(a) **Work out** the size of the angle marked *x*.

.....°

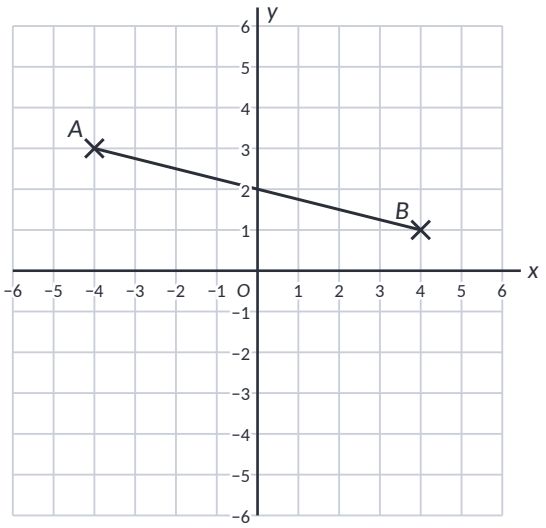
(2)

(b) A student says that an angle of 130° is a reflex angle.
The student is wrong.
Explain why.

(1)

(Total for Question 8 is 3 marks)

9



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 point *B*.

(1)

(b) **Plot** the point with coordinates (−2, −3)
Label this point *C*.

(1)

(c) **Write down** the coordinates of the midpoint of *AB*.

(1)

(d) **Draw** the line with equation $x = 3$

(1)

(Total for Question 9 is 4 marks)

10 Ava sees this special offer in a shop.

> Buy one large mug and get one small mug for half the normal price.

The normal price of a large mug is £3
The normal price of a small mug is £1.20
Ava wants to buy 5 large mugs and 5 small mugs using this offer.
She has £17.50
Has Ava got enough money?
You must show how you get your answer.

> **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 10 is 4 marks)

11 A total of 900 tickets were on sale for a concert.
638 of the tickets were sold.

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

(a) How many tickets were **not** sold?

.....

(2)

(b) For a different concert,
296 tickets were sold for £8.80 each
497 tickets were sold for £14.70 each.
Work out an estimate for the total amount of money paid for these tickets.
You must show all your working.

£ .....

(3)

(c) Is your answer to part (b) an underestimate or an overestimate?
Give a reason for your answer.

(1)

(Total for Question 11 is 6 marks)

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12 Here are 6 numbers.

12 7 3 10 6 4

Work out the mean.

.....

(2)

(Total for Question 12 is 2 marks)

13

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

(a) **Simplify** $\frac{20b}{4}$

.....

(1)

(b) **Simplify** $15 + 3a + 5c - 8a + c$

.....

(2)

(c) **Factorise** $10m - 4$

.....

(1)

(Total for Question 13 is 4 marks)

14 Last week, 64% of the tickets sold at a theatre were adult tickets.

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

(a) What percentage of the tickets sold were **not** adult tickets?

..... %

(1)

(b) Some people watched a play at the theatre.

number of adults : number of children = 3 : 4

What fraction of these people were adults?

.....

(1)

(c) On Saturday,

600 people watched a play at the theatre.

45% of these people were children.

On Sunday,

480 people watched the play at the theatre.

$\frac{5}{8}$ of these people were children.

Leah thinks more children watched the play on Saturday than on Sunday.

Is Leah correct?

You must show how you get your answer.

(3)

(Total for Question 14 is 5 marks)

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15 **Work out** $\frac{4}{9} \times \frac{3}{8}$

Give your answer as a fraction **in its simplest form**.

.....

(2)

(Total for Question 15 is 2 marks)

---

16 Here is the list of ingredients for making 15 scones.

Ingredients for 15 scones
200 g flour
50 g butter
120 ml milk

Ruby wants to make 45 scones.
How much flour does Ruby need?

..... g

(2)

(Total for Question 16 is 2 marks)

17 There are 250 counters in a bag.
45 counters are red.
65 counters are blue.
The rest of the counters are yellow or green.
There are the same number of yellow counters as green counters.
What percentage of the counters in the bag are yellow?

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

..... %

(4)

(Total for Question 17 is 4 marks)

18 Josh has p packs of cards and q boxes of cards.
There are 6 cards in each pack.
There are 24 cards in each box.
Josh has a total of N cards.
Write a formula for N **in terms of p and q**.

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

.....

(3)

(Total for Question 18 is 3 marks)

19 Here are the first five terms of an arithmetic sequence.

−4 2 8 14 20

Find an expression, **in terms of *n***, for the *n*th term of this sequence.

.....

(2)

(Total for Question 19 is 2 marks)

20 **Work out** 7.38 ÷ 0.18

> **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 20 is 3 marks)

21 **Work out** $6\frac{2}{5} - 3\frac{3}{4}$

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

> **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.

.....

(3)

(Total for Question 21 is 3 marks)

22 A cube has a total surface area of 294 cm^2

Work out the volume of the cube.

> **Remember** Find the area of every face and add them. A cuboid has 3 pairs of equal faces.

..... cm^3

(4)

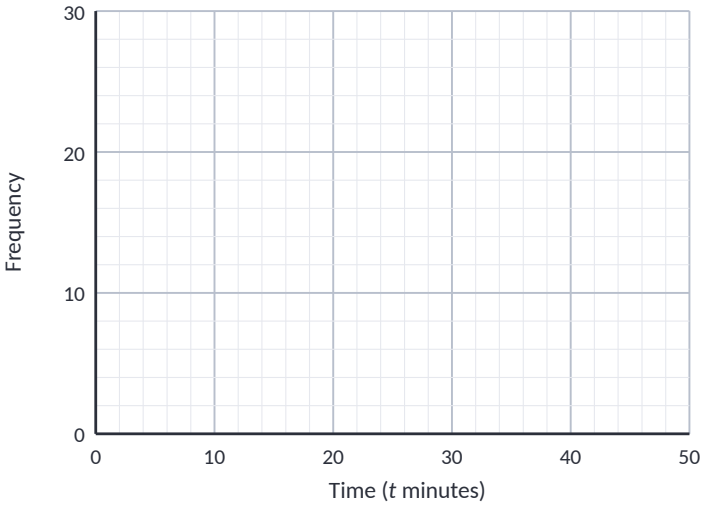
(Total for Question 22 is 4 marks)

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23 The table shows information about the times, in minutes, that 60 people waited at a doctor's surgery.

Time (t minutes)	Frequency
$0 \leqslant t < 10$	6
$10 \leqslant t < 20$	15
$20 \leqslant t < 30$	22
$30 \leqslant t < 40$	12
$40 \leqslant t < 50$	5

Draw a frequency polygon for this information.



(2)

(Total for Question 23 is 2 marks)

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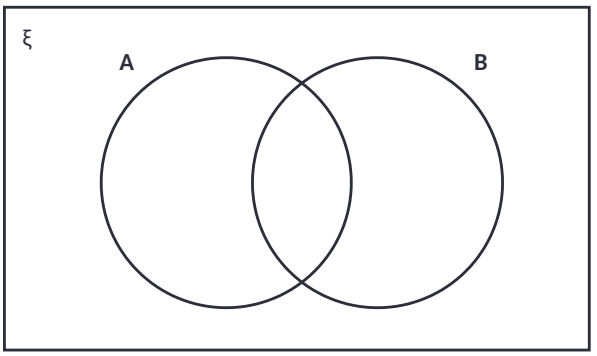
24 $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

$A = \{\text{even numbers}\}$

$B = \{\text{multiples of 3}\}$

> **Remember** Fill the overlap (in both) first. Every number from ξ goes somewhere, even outside the circles.

(a) **Complete** the Venn diagram for this information.



(3)

(b) A number is chosen at random from the universal set ξ

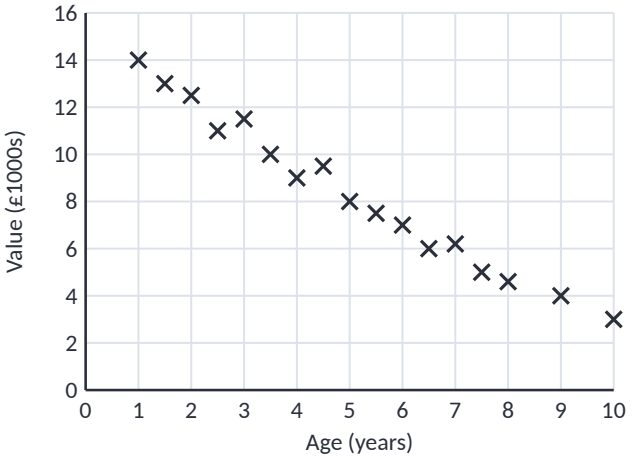
Find the probability that this number is in the set B'

.....

(2)

(Total for Question 24 is 5 marks)

25 The scatter graph shows information about the ages and values of some cars.



Remember Positive: both go up. Negative: one goes up, the other down. Draw a line of best fit through the middle of the points.

(a) **Describe** the relationship between the age and the value of the cars.

(1)

(b) Another car has a value of £6000
Using the scatter graph, find an estimate for the age of this car.

..... years

(2)

(Total for Question 25 is 3 marks)

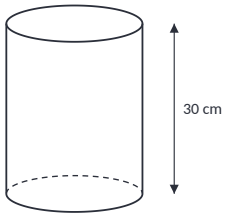
26 The price of a sofa increases by 15%
This 15% increase adds £84 to the price of the sofa.
Work out the price of the sofa before the increase.

£ .....

(2)

(Total for Question 26 is 2 marks)

27 The diagram shows a solid cylinder on a horizontal floor.



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

The cylinder has a

volume of 1500 cm^3

height of 30 cm.

The cylinder exerts a force of 120 newtons on the floor.

Work out the pressure on the floor due to the cylinder.

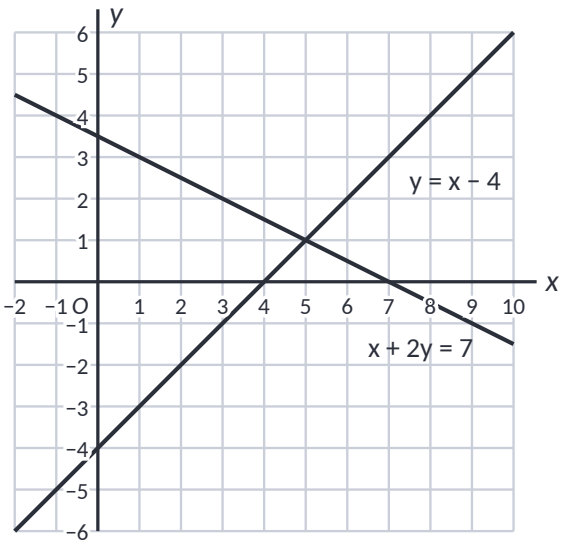
Remember Density = mass ÷ volume. Mass = density × volume. Volume = mass ÷ density. Pressure = force ÷ area.

..... newtons/cm^2

(3)

(Total for Question 27 is 3 marks)

28



Use these graphs to solve the simultaneous equations

$$y = x - 4$$

$$x + 2y = 7$$

x = ...

y = ...

(1)

(Total for Question 28 is 1 mark)

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29 **Work out** the value of $\frac{3^{-5} \times 3^{7}}{3}$

.....

(2)

(Total for Question 29 is 2 marks)

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30 **Write down** the exact value of sin 30°

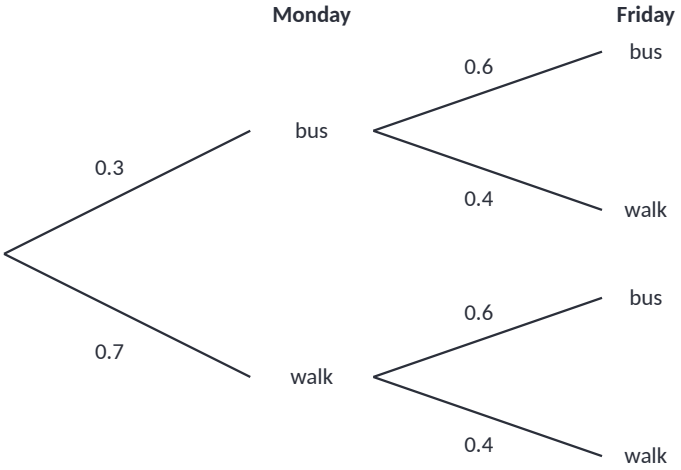
.....

(1)

(Total for Question 30 is 1 mark)

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31 The probability tree diagram shows the probabilities that Noah will travel to school by bus or will walk to school on two days next week.



Work out the probability that Noah will walk to school on Monday and travel by bus on Friday.

.....

(2)

(Total for Question 31 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

E1 mark scheme

Q		Answer	Mark	Notes
1		0.46	B1	
2		$\frac{3}{8}$	B1	
3		2.7	B1	
4		−4	B1	
5		7	B1	
6		The line labelled Radius goes right across the circle through the centre, so it is a diameter	C1	C1
7		Any three of 1, 2, 3, 5, 6, 10, 15, 30	B2	B2 (B1 for two correct)
8	(a)	115	M1 A1	M1 for 180 − 65 A1 cao
	(b)	A reflex angle is more than 180°; 130° is an obtuse angle	C1	C1
9	(a)	(4, 1)	B1	
	(b)	Point at (−2, −3) labelled C	B1	
	(c)	(0, 2)	B1	
	(d)	Vertical line through $x = 3$	B1	
10		No: the mugs cost £18	M1 M1 A1 C1	M1 for 1.20 ÷ 2 (= 0.60) M1 for 5 × 3 (= 15) or 5 × 0.60 (= 3) A1 for 18 C1 No with 18

Mark scheme continues ►

Q		Answer	Mark	Notes
11	(a)	262	M1 A1	M1 for 900 − 638 A1 cao
	(b)	10 200	M1 M1 A1	M1 for rounding to 300, 9, 500, 15 M1 for 300 × 9 + 500 × 15 A1 for 10 200
	(c)	Overestimate: all the numbers were rounded up	C1	C1
12		7	M1 A1	M1 for 42 ÷ 6 A1 cao
13	(a)	$5b$	B1	
	(b)	$15 - 5a + 6c$	B2	B2 (B1 for two terms correct)
	(c)	$2(5m - 2)$	B1	
14	(a)	36	B1	
	(b)	$\frac{3}{7}$	B1	
	(c)	No: 270 children on Saturday, 300 on Sunday	M1 M1 C1	M1 for 0.45 × 600 (= 270) or 480 ÷ 8 × 5 (= 300) M1 for both C1 No with 270 and 300
15		$\frac{1}{6}$	M1 A1	M1 for $\frac{12}{72}$ oe A1 cao
16		600	M1 A1	M1 for 45 ÷ 15 (= 3) A1 cao
17		28	M1 M1 M1 A1	M1 for 250 − 45 − 65 (= 140) M1 for 140 ÷ 2 (= 70) M1 for 70 ÷ 250 × 100 A1 cao
18		$N = 6p + 24q$	M1 M1 A1	M1 for $6p$ or $24q$ M1 for $6p + 24q$ A1 for $N = 6p + 24q$
19		$6n - 10$	M1 A1	M1 for $6n + k$ A1 cao
20		41	M1 M1 A1	M1 for 738 ÷ 18 or equivalent M1 for a complete method A1 cao

Mark scheme continues ►

Q		Answer	Mark	Notes
21		$2\frac{13}{20}$	M1 M1 A1	M1 for $\frac{32}{5}$ and $\frac{15}{4}$ or a common denominator of 20 M1 for $\frac{128}{20} - \frac{75}{20}$ A1 cao
22		343	M1 M1 M1 A1	M1 for 294 ÷ 6 (= 49) M1 for √49 (= 7) M1 for 7^3 A1 cao
23		Points at (5, 6), (15, 15), (25, 22), (35, 12), (45, 5) joined	B2	B2 (B1 for points at midpoints or correct heights)
24	(a)	*A* only: 2, 4, 8, 10; both: 6, 12; *B* only: 3, 9; outside: 1, 5, 7, 11	B3	B3 all correct (B2 for 10 or 11 correct, B1 for at least 6 correct)
	(b)	$\frac{8}{12}$	M1 A1	M1 ft for a numerator of 8 or a denominator of 12 A1 oe
25	(a)	As the age increases, the value decreases (negative correlation)	C1	C1
	(b)	6.7	M1 A1	M1 for a line of best fit or a reading at 6 A1 for 6 to 7.5
26		560	M1 A1	M1 for 84 ÷ 15 × 100 or 84 ÷ 0.15 A1 cao
27		2.4	M1 M1 A1	M1 for 1500 ÷ 30 (= 50) M1 for 120 ÷ 50 A1 cao
28		$x = 5, y = 1$	B1	B1
29		3	M1 A1	M1 for 3^2 or 3^{-5+7-1} A1 cao
30		$\frac{1}{2}$	B1	
31		0.42	M1 A1	M1 for 0.7 × 0.6 A1 cao

Mark scheme continues ►

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

Score ____ / 80