Half paper C3

Paper 2 style · Calculator · Foundation

36 marks
about 35–40 minutes

Name	Date	Score / 36

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** $\frac{3}{1000}$ as a decimal.

.....

(1)

(Total for Question 1 is 1 mark)

---

2 **Write down** a multiple of 9 that is between 60 and 70

.....

(1)

(Total for Question 2 is 1 mark)

---

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

(a) **Simplify** $7p \times 2q$

.....

(1)

(b) **Simplify** $w \times w \times w$

.....

(1)

(c) **Simplify** $\frac{4x + 10y}{2}$

.....

(1)

(Total for Question 3 is 3 marks)

Turn over ►

4 72 students were asked how they travel to school.
The table shows the results.

	Bus	Walk	Car	Bicycle
Number of students	18	30	12	12

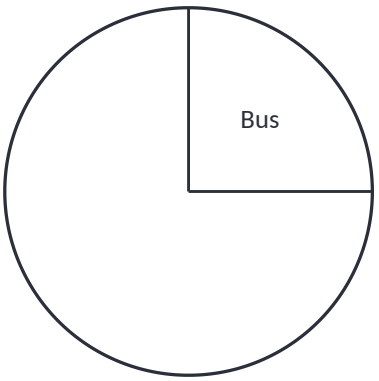
Remember Angle for each = frequency × (360 ÷ total). The angles must add up to 360°.

(a) What fraction of the 72 students did **not** walk to school?

.....

(2)

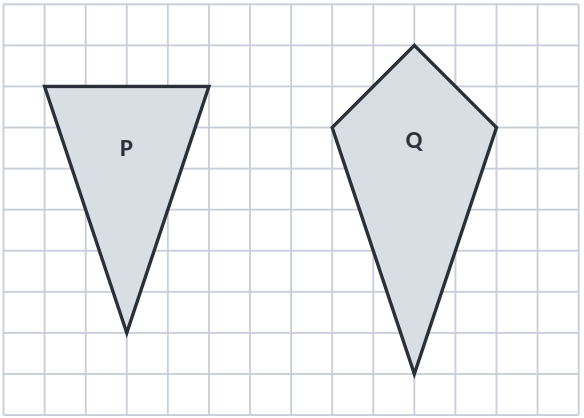
(b) **Complete** the pie chart for the information in the table.



(4)

(Total for Question 4 is 6 marks)

5 The diagram shows two shapes drawn on a centimetre grid.



Remember Triangle = ½ × base × height. Trapezium = ½ × (a + b) × height. Use the perpendicular height.

(a) **Find** the area of shape **P**.

..... cm^2

(2)

(b) **Write down** the mathematical name of quadrilateral **Q**.

.....

(1)

(Total for Question 5 is 3 marks)

6 240 people live in a town.

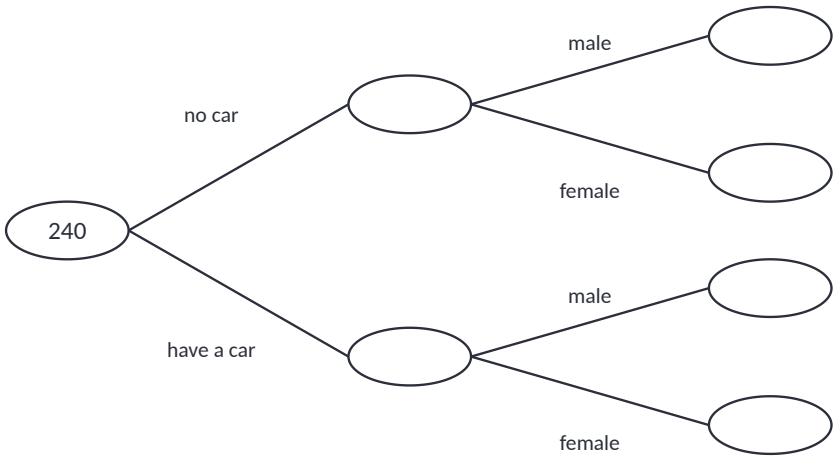
30 people do **not** have a car.

12 males do **not** have a car.

110 people are male.

> **Remember** Each pair of branches adds up to the number before it. Fill in the numbers you are given first.

(a) Use this information to complete the frequency tree.



(3)

(b) One of the people who does **not** have a car is chosen at random.
Write down the probability that this person is female.

.....

(2)

(Total for Question 6 is 5 marks)

---

7 Mia makes greetings cards.

She makes at least 20 cards per hour.

She is paid 35p for each card she makes.

Tom works in a café.

He works 30 hours and is paid a total of £201

Show that Mia's hourly rate of pay is more than Tom's hourly rate of pay.

> **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.

(3)

(Total for Question 7 is 3 marks)

---

8 a and b are odd numbers.

> **Remember** Factors divide into a number. Multiples are in its times table. A prime has exactly two factors.

(a) Give an example to show that the value of $3(a + b)$ is a multiple of 6

(2)

(b) **Show that**, when a and b are both odd numbers, the value of $3(a + b)$ will always be a multiple of 6

(2)

(Total for Question 8 is 4 marks)

---

9 **Solve** $4x - 7 = 2(x + 3)$

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

$x =$ .....

(3)

(Total for Question 9 is 3 marks)

---

10 Leo buys a pack of 24 cans of drink.
The pack costs £7.80
Leo sells all 24 cans for 45p each.
Work out Leo's percentage profit.
Give your answer **correct to 1 decimal place**.

> **Remember** Percentage change = change ÷ original × 100. Multipliers: increase by 5% → × 1.05, decrease by 5% → × 0.95.

..... %

(3)

(Total for Question 10 is 3 marks)

11

> **Remember** Multiply: add the powers. Divide: subtract the powers. Power of a power: multiply the powers. Anything to the power 0 = 1.

(a) $p^4 \times p^x = p^{11}$

Find the value of x.

$x =$ .....

(1)

(b) $(5^3)^y = 5^{12}$

Find the value of y.

$y =$ .....

(1)

(c) $10^a \times 100^b$ can be written in the form 10^w

Show that $w = a + 2b$

(2)

(Total for Question 11 is 4 marks)

TOTAL FOR PAPER IS 36 MARKS

C3 mark scheme

Q		Answer	Mark	Notes
1		0.003	B1	
2		63	B1	
3	(a)	$14pq$	B1	
	(b)	w^3	B1	
	(c)	$2x + 5y$	B1	
4	(a)	$\frac{42}{72} = \frac{7}{12}$	M1 A1	M1 for $72 - 30$ or $\frac{42}{72}$ A1 oe
	(b)	Walk 150°, Car 60°, Bicycle 60°, labelled	M1 A1 A1 B1	M1 for $360 \div 72$ (= 5) A1 for two correct angles A1 for all angles correct B1 for labelled sectors
5	(a)	12	M1 A1	M1 for $\frac{1}{2} \times 4 \times 6$ A1 cao
	(b)	kite	B1	
6	(a)	no car 30: male 12, female 18; have a car 210: male 98, female 112	B3	B3 all correct (B2 for 4 or 5 correct, B1 for 2 or 3 correct)
	(b)	$\frac{18}{30}$	M1 A1	M1 ft for a denominator of 30 A1 oe
7		Mia: at least 20 × 35p = £7 per hour; Tom: 201 ÷ 30 = £6.70 per hour	M1 M1 C1	M1 for 20×0.35 (= 7) M1 for $201 \div 30$ (= 6.70) C1 for a correct comparison
8	(a)	e.g. $3(1 + 3) = 12$, which is a multiple of 6	M1 A1	M1 for substituting two odd numbers A1 for a correct multiple of 6
	(b)	odd + odd = even, so $a + b = 2k$; $3 \times 2k = 6k$, a multiple of 6	M1 C1	M1 for odd + odd = even C1 for a complete argument

Mark scheme continues ►

Q		Answer	Mark	Notes
9		6.5	M1 M1 A1	M1 for $4x - 7 = 2x + 6$ M1 for $2x = 13$ A1 oe
10		38.5	M1 M1 A1	M1 for 24×0.45 (= 10.80) M1 for $(10.80 - 7.80) \div 7.80 \times 100$ A1 for 38.5
11	(a)	7	B1	
	(b)	4	B1	
	(c)	$100^b = (10^2)^b = 10^{2b}$, so $10^a \times 10^{2b} = 10^{a+2b}$	M1 A1	M1 for $100 = 10^2$ A1 for a complete argument

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

Score ____ / 36

Write your score on the front page