CALC J · MARK SCHEME

GCSE Mathematics · Foundation Tier

40 marks · 45 minutes · Calculator

M method **A** accuracy (depends on M) **B** independent **P** process **C** communication
oe or equivalent cao correct answer only ft follow through Accept any correct, fully justified method.

Question 1

Powers and roots · N6 · Number · AO1 · 2 marks

QN	ANSWER	MARK	GUIDANCE
1(a)	**343**	**B1**	cao
1(b)	**1.3**	**B1**	Accept ± 1.3

Question 2

Simplifying ratios · R3 · R4 · Ratio & proportion · AO1 · 2 marks

QN	ANSWER	MARK	GUIDANCE
2(a)	**3 : 5**	**B1**	cao
2(b)	**1 : 1.67**	**B1**	Accept $1 : \frac{5}{3}$, $1 : 1\frac{2}{3}$ or 1 : 1.6 recurring

Question 3

Units of measure · N13 · Number · AO1 · 2 marks

QN	ANSWER	MARK	GUIDANCE
3(a)	**340 000**	**B1**	cao
3(b)	**150**	**B1**	cao

Question 4

Simplifying expressions · A4 · A1 · Algebra · AO1 · 2 marks

QN	ANSWER	MARK	GUIDANCE
4(a)	$12pq$	**B1**	Accept $12qp$ or $12 \times p \times q$
4(b)	m^8	**B1**	cao

Question 5

Mean and median from a table · S4 · Statistics · AO1/2 · 3 marks

QN	ANSWER	MARK	GUIDANCE
5(a)	1.67	M1	For 0 + 9 + 14 + 15 + 12 (= 50) or $\Sigma fx \div 30$
		A1	Accept 1.66 to 1.67 or $\frac{5}{3}$
5(b)	Yes, with median 1.5	C1	For 'Yes' with median 1.5 (15th value 1, 16th value 2) compared with their mean

Question 6

Circumference · G17 · N2 · Geometry & measures · AO1/3 · 3 marks

QN	ANSWER	MARK	GUIDANCE
6(a)	11.3	M1	For π × 3.6 or 2 × π × 1.8
		A1	Accept 11.3 or answers rounding to 11.3
6(b)	100.80	B1	For 12 × 8.40; ft their (a) rounded up to a whole number × 8.40

Question 7

Conversion graphs · A14 · R10 · Algebra · AO1/2 · 3 marks

QN	ANSWER	MARK	GUIDANCE
7(a)	48	B1	Accept 47 to 49
7(b)	125	M1	For a correct method using the graph, e.g. 40 km = 25 miles and × 5, or 80 km = 50 miles, so 160 km = 100 miles plus 40 km = 25 miles
		A1	Accept 123 to 127

Question 8

Tree diagrams · P6 · P8 · Probability · AO1/2 · 3 marks

QN	ANSWER	MARK	GUIDANCE
8(a)	**0.6 on all three blue branches, 0.4 on the remaining red branch**	**B1**	All four missing probabilities correct; accept fractions
8(b)	**0.36**	**M1**	For 0.6 × 0.6, ft their tree
		A1	Accept $\frac{36}{100}$ or $\frac{9}{25}$

Question 9

Powers and rounding · N7 · N15 · Number · AO1 · 2 marks

QN	ANSWER	MARK	GUIDANCE
9(a)	**53.1441**	**B1**	cao
9(b)	**53**	**B1**	ft their (a)

Question 10

Map scales · G15 · R2 · Geometry & measures · AO1 · 2 marks

QN	ANSWER	MARK	GUIDANCE
10	**1.85**	**M1**	For 7.4 × 25 000 (= 185 000 cm)
		A1	cao

Question 11

Percentage change · R9 · Ratio & proportion · AO2 · 2 marks

QN	ANSWER	MARK	GUIDANCE
11	**Yes, with 12%**	**M1**	For $\frac{22\,200}{185\,000}$ or 207 200 ÷ 185 000 (= 1.12), or 10% of 185 000 = 18 500 compared with 22 200
		C1	For 'Yes' with 12% or a correct comparison

Question 12

Forming and solving equations · A21 · A17 · Algebra · AO3 · 3 marks

QN	ANSWER	MARK	GUIDANCE
12	6	P1	For $4n - 7$ or $n + 11$
		P1	For $4n - 7 = n + 11$ and a correct step, e.g. $3n = 18$
		A1	cao. Correct answer from trial and improvement with a check scores full marks

Question 13

Speed, distance, time · R11 · N13 · Ratio & proportion · AO3 · 4 marks

QN	ANSWER	MARK	GUIDANCE
13	11	P1	For 186 ÷ 110 (= 1.69... hours)
		P1	For converting to minutes, 1.69... × 60 (= 101.4...), or the train time as 90 minutes
		P1	For 101.4... – 90
		A1	Accept 11 (or 11.4 to 11.5). 1 h 30 min as 1.3 h scores P1 P0 P0 A0

Question 14

Length of a line · G20 · A8 · Geometry & measures · AO2 · 3 marks

QN	ANSWER	MARK	GUIDANCE
14	10	M1	For the horizontal and vertical distances 6 and 8
		M1	For $6^2 + 8^2$ (= 100)
		A1	cao

Question 15

Fractions and ratio problem · N12 · R5 · R8 · Number · AO3 · 4 marks

QN	ANSWER	MARK	GUIDANCE
15	1200	P1	For Ben = 3 × 180 (= 540) or the rest = 4 × 180 (= 720)
		P1	For recognising 720 is $\frac{3}{5}$ of the total
		P1	For 720 ÷ 3 × 5 or 720 ÷ 0.6
		A1	cao

Paper overview

Q	TOPIC	SPEC REF	STRAND	AO	MARKS
1	Powers and roots	N6	Number	AO1	2
2	Simplifying ratios	R3 · R4	Ratio & proportion	AO1	2
3	Units of measure	N13	Number	AO1	2
4	Simplifying expressions	A4 · A1	Algebra	AO1	2
5	Mean and median from a table	S4	Statistics	AO1/2	3
6	Circumference	G17 · N2	Geometry & measures	AO1/3	3
7	Conversion graphs	A14 · R10	Algebra	AO1/2	3
8	Tree diagrams	P6 · P8	Probability	AO1/2	3
9	Powers and rounding	N7 · N15	Number	AO1	2
10	Map scales	G15 · R2	Geometry & measures	AO1	2
11	Percentage change	R9	Ratio & proportion	AO2	2
12	Forming and solving equations	A21 · A17	Algebra	AO3	3
13	Speed, distance, time	R11 · N13	Ratio & proportion	AO3	4
14	Length of a line	G20 · A8	Geometry & measures	AO2	3
15	Fractions and ratio problem	N12 · R5 · R8	Number	AO3	4
Total					**40**

Marks by strand

Number	**8 marks (20%)**
Algebra	**8 marks (20%)**
Ratio & proportion	**10 marks (25%)**
Geometry & measures	**8 marks (20%)**
Probability	**3 marks (8%)**
Statistics	**3 marks (8%)**

Marks by assessment objective

AO1	Standard techniques	**18 marks (45%)**
AO2	Reasoning	**10 marks (25%)**
AO3	Problem solving	**12 marks (30%)**