OXFORD

INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL GCSE
MATHEMATICS
9260/1C

Paper 1C Core Tier

Mark scheme

June 2022

Version: 1.0 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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Key to mark types and abbreviations

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between a and b inclusive.
[a, b)	Accept values a $\leqslant$ value $<$ b
3.14…	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Q	Answer	Mark	Comments
1	19°	B1	

Q	Answer	Mark	Comments
2	$\frac{1}{7}$ of 35	B1	

Q	Answer	Mark	Comments
3	regular	B1	

Q	Answer	Mark	Comments
4	$x = y - 4$	B1	

Q	Answer	Mark	Comments
5(a)	13	B1	

Q	Answer	Mark	Comments
5(b)	$\frac{22}{45}$	B1	
	Additional Guidance		
	Ignore any attempt at cancelling once correct fraction seen		

Q	Answer	Mark	Comments
6(a)	Two of (Tuesday) 3.5 or 3 h 30 min (Thursday) 4 (Friday) 6	M1	oe condone 3.30 implied by 13.5 or any two of 35.7(0), 40.8(0) and 61.2(0)
	(their 3.5 + their 4 + their 6) × 10.2(0) or their 3.5 × 10.2(0) + their 4 × 10.2(0) + their 6 × 10.2(0) or 35.7(0) + 40.8(0) + 61.2(0) with two correct or 13.5 × 10.2(0)	M1dep	oe
	137.7(0)	A1	SC2 135.66 SC1 168.3(0)
	Additional Guidance		
	No daily hours shown but three totals added with two correct eg 30.6 + 40.8 + 61.2		M2A0
	SC2 for using 3.3 instead of 3.5 but otherwise correct		
	SC1 for one extra hour included each day		

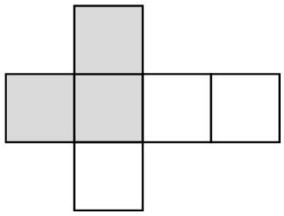
Q	Answer	Mark	Comments
6(b)	132.6(0) ÷ (10.2(0) × 2) or 132.6(0) ÷ 20.4(0) or 13 ÷ 2	M1	oe
	6.5 or $\frac{13}{2}$ or $6\frac{1}{2}$	A1	SC1 13 accept 6 h 30 min
	Additional Guidance		
	Ignore rounding or truncation once correct answer seen		

Q	Answer	Mark	Comments
7	(0 × 5 +) 1 × 3 + 2 × 2 + 3 × 2 (+ 4 × 0) + 5 × 2 or (0) 3 4 6 (0) 10	M1	allow one incorrect product
	23	A1	
	Additional Guidance		
	Products seen by the table but then another method used		M0
	Further work using 23 eg 23 – 14 = 9		M1A0

Q	Answer	Mark	Comments
8(a)	–6	B1	may be on diagram

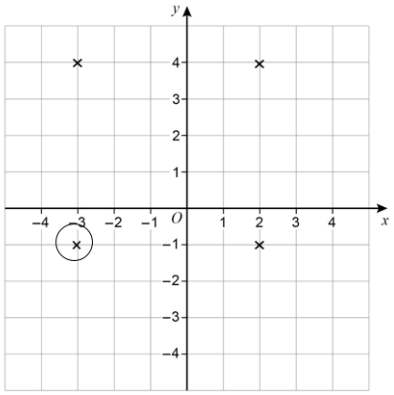
Q	Answer	Mark	Comments
8(b)	Two values for n and k such that $0.5n + k = 9.5$	B1	eg n = 1, k = 9 n = 2, k = 8.5 n = 3, k = 8 n = 4, k = 7.5 n = 5, k = 7 n = 6, k = 6.5 n = 7, k = 6 n = 8, k = 5.5 n = 9, k = 5 n = 10, k = 4.5 n = 11, k = 4 n = 12, k = 3.5 n = 13, k = 3 n = 14, k = 2.5 n = 15, k = 2 n = 16, k = 1.5 n = 17, k = 1 n = 18, k = 0.5 n = 19, k = 0 n = 20, k = –0.5
	Additional Guidance		
	n does not need to be an integer eg (n =) 2.5, (k =) 8.25		B1

Q	Answer	Mark	Comments
9	Tangent drawn at *P*	B1	mark intention
	Additional Guidance		
	Tangent does not need to be extended past the point		

Q	Answer	Mark	Comments
10		B1	

Q	Answer	Mark	Comments
11(a)	Thursday	B1	any unambiguous indication

Q	Answer	Mark	Comments
11(b)	9 + 6 + 7 + 3 + 5 + 5 + 3 + 8 or 15 + 10 + 10 + 11 or 24 + 22 or 46	M1	7 correct frequencies or 3 correct daily totals
	60 – their 46 or 14	M1dep	may be implied from the two bars drawn
	Bars drawn in the correct position Products = 8 and Delivery = 6 and bar for Products on the left	A1	SC1 both bars drawn with Products 2 more than Delivery
	Additional Guidance		
	Incorrect bars drawn totalling 14		M1M1A0
	Bars drawn Products = 6 and Delivery = 8 (implies 14)		M1M1A0
	Allow no or incorrect shading		

Q	Answer	Mark	Comments
12	(–3, –1)	B2	B1 one correct coordinate or plots the three given points correctly or marks the correct point but does not state the coordinates SC1 (–1, –3)
	Additional Guidance		
			B1

Q	Answer	Mark	Comments
13	28	B1	cost for Wheels
	3 × 9.75 or 29.25	M1	cost for Rollers
	1.25	A1ft	ft 3 × 9.75 – their 28 their 28 must be [10, 29]

Q	Answer	Mark	Comments
14	**Alternative method 1**		
	0.25 × 96 or 24	M1	oe
	96 – 12 – their 24	M1dep	oe
	60	A1	SC1 63
	Alternative method 2		
	(1 – 0.25) × 96 or 0.75 × 96 or 72	M1	oe
	their 72 – 12	M1dep	oe
	60	A1	SC1 63
	Additional Guidance		
	SC1 for 0.75 × (96 – 12)		

Q	Answer	Mark	Comments
15(a)	28 × 8 and 224 or 216 ÷ 8 and 27 or 216 ÷ 28 and 7.7(1…)	B1	oe eg 27 × 8 = 216 must see calculation and answer
	Additional Guidance		
	Correct calculation with other calculation(s) seen eg 27 × 8 = 216 and 7 × 4 = 28		B0
	28 × 7 = 196		B0
	28 × 8 and 220		B0
	224		B0
	27		B0
	7.7(1…)		B0

Q	Answer	Mark	Comments
15(b)	**Alternative method 1**		
	0.1(0) × 372 or 37.2(0) or 1 – 0.1(0) or 0.9(0)	M1	oe eg 372 ÷ 10
	372 – their 37.2(0) or their 0.9(0) × 372 or 334.8(0)	M1dep	oe
	$\frac{216+28}{55}$ or $\frac{244}{55}$ or 4.4(3…) or 4.44 or 5	M1	oe eg $\frac{216}{55} + \frac{28}{55}$ or 3.9… + 0.5(0…) or 3.9 + 0.51
	their 334.8(0) × their 5	M1	their 334.8(0) can be 372 their 5 must be a rounded up integer from calculation or value seen
	1674	A1	
	Alternative method 2		
	$\frac{216+28}{55}$ or $\frac{244}{55}$ or 4.4(3…) or 4.44 or 5	M1	oe
	372 × their 5 or 1860	M1	their 5 must be a rounded up integer from calculation or value seen
	0.1(0) × their 1860 or 186(.0) or 1 – 0.1(0) or 0.9(0)	M1	oe eg 1860 ÷ 10 their 1860 can be 372 multiplied by any value
	their 1860 – their 186(.0) or their 0.9(0) × 360	M1dep	oe dep on 3rd M1
	1674	A1	

Additional Guidance is on the next page

15(b) cont	**Additional Guidance**	
	Alt 1 $0.9 \times 372 = 334.80$ $\frac{216}{55} = 3.9$ $4 \times 334.80 = 1339.2(0)$	M1M1 M0 M1A0
	Alt 2 $\frac{216}{55} = 3.9$ $4 \times 372 = 1488$ $1488 \times 0.9 = 1339.2(0)$	M0 M1 M1M1A0

Q	Answer	Mark	Comments
16	$180 - 90 - 60$ or $180 - 150$ or 30	M1	may be on diagram
	$(180 - \text{their } 30) \div 2$ or $150 \div 2$	M1dep	
	75	A1	may be on diagram
	Additional Guidance		
	75 seen at *B* on diagram with an incorrect answer given		M2A0

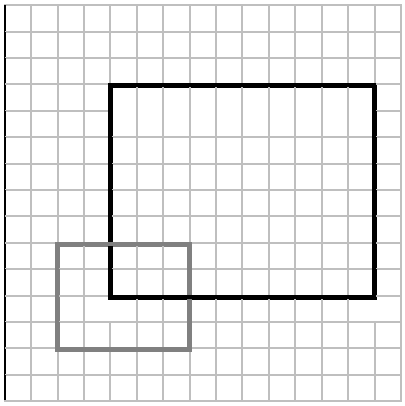
Q	Answer	Mark	Comments
17(a)	$11c + 5$	B2	B1 $(12c - c =) 11c$ or $\left(\frac{10c}{2c} =\right) 5$
	Additional Guidance		
	$5 + 11c$		B2
	$11c + 5c = 16c$		B1
	$11c + 5$ followed by further incorrect work scores B1 eg $11c + 5 = 16c$		B1

Q	Answer	Mark	Comments
17(b)	9 or 16	M1	
	25	A1	SC1 7 or 1033

Q	Answer	Mark	Comments
18	Any set of 5 different integers with median 10	M1	
	(1 + 2 + 10 + 11 + 12) ÷ 5 or 36 ÷ 5 or sum of their five numbers ÷ 5	M1	allow repeated numbers
	7.2	A1	oe
	Additional Guidance		
	(0 + 1 + 10 + 11 + 12) ÷ 5 or 0 1 10 11 12 with answer 6.8		M1M1A0
	(8 + 9 + 10 + 11 + 12) ÷ 5 or 8 9 10 11 12 with answer 10		M1M1A0
	(1 + 2 + 3 + 4 + 5) ÷ 5 or 1 2 3 4 5 with answer 3		M0M1A0
	1 + 2 + 10 + 11 + 12 ÷ 5 unless recovered		M1M0

Q	Answer	Mark	Comments
19(a)	$\begin{pmatrix}-4\\-5\end{pmatrix}$ or description	B1	eg 4 (squares) left, 5 (squares) down
	Additional Guidance		
	Condone correct description and incorrect translation vector		B1
	(–4, –5)		B0

Q	Answer	Mark	Comments
19(b)	180° or half-turn	B1	
	origin or O or (0, 0)	B1	
	Additional Guidance		
	Ignore description of direction of turn		

Q	Answer	Mark	Comments
19(c)	Correct rectangle drawn	B2	B1 8 by 10 rectangle drawn in any position
	Additional Guidance		
			B2

Q	Answer	Mark	Comments
20(a)	$y - 2 = 0$	B1	

Q	Answer	Mark	Comments
20(b)	$y = 8 - x$ or $x + y = 8$	B2	oe eg $x = 8 - y$ B1 $y = -x$ (+ c) or $y = mx + 8$ oe or $8 - x$
	Additional Guidance		
	$y = -x$		B1
	$y = x + 8$		B1
	$y = 8$		B0
	$8 - x = 0$		B0

Q	Answer	Mark	Comments
21	**Alternative method 1**		
	$\frac{\pi \times 9^2}{2}$ or $\frac{81\pi}{2}$ or [127.17, 127.3] or 127	M1	oe eg 40.5π
	9 × 18 – their [127.17, 127.3] or $162 - 40.5\pi$ or [34.7, 34.83] or 35	M1dep	oe eg $2 \times \left(9 \times 9 - \frac{\pi \times 9^2}{4}\right)$
	0.2 × 9 × 18 or 32.4	M1	oe
	[34.7, 34.83] or 35 and 32.4	A1	SC1 162 seen
	Alternative method 2		
	$\frac{\pi \times 9^2}{2}$ or $\frac{81\pi}{2}$ or [127.17, 127.3] or 127	M1	oe eg 40.5π
	9 × 18 – their [127.17, 127.3] or $162 - 40.5\pi$ or [34.7, 34.83] or 35	M1dep	oe eg $(18 \times 18 - \pi \times 9^2) \div 2$
	$\frac{\text{their [34.7, 34.83]}}{9 \times 18}$ or [0.214, 0.21605]	M1dep	oe accept 0.21 with working
	[21.4, 21.605]	A1	oe eg [0.214, 0.21605] and 0.2 accept 21 with working SC1 162 seen

Alternative method 3 and Additional Guidance are on the next page

21 cont	**Alternative method 3**		
	$\frac{\pi \times 9^2}{2}$ or $\frac{81\pi}{2}$ or [127.17, 127.3] or 127	M1	oe eg 40.5π
	$\frac{\text{their [127.17, 127.3]}}{9 \times 18}$ or [0.784, 0.786] or [78.4, 78.6]	M1dep	oe accept 0.79 with working accept 79 with working
	1 – their [0.784, 0.786] or [0.214, 0.21605] or 100 – their [78.4, 78.6] or 1 – 0.2 or 100 – 20	M1dep	oe accept 0.21 with working accept 100 – 79 with working
	[21.4, 21.605]	A1	oe eg [0.214, 0.21605] and 0.2 accept 21 with working SC1 162 seen
	Additional Guidance		
	Beware [21.4, 21.605] from using diameter 9		Zero

Q	Answer	Mark	Comments
22	12	B1	

Q	Answer	Mark	Comments
23(a)	0.3 or $\frac{3}{10}$ or 30%	B1	condone %30
	Additional Guidance		
	3 : 7 or 3 : 10		B0

Q	Answer	Mark	Comments
23(b)	No and a valid reason	B1	eg not enough trials
	Additional Guidance		
	Ignore non-contradictory comments eg about bias alongside a correct reason		
	No not enough data		B1
	No need more spins		B1
	No need a larger sample / 10 is a small sample		B1
	No it was **only** spun 10 times		B1
	No it shows the relative frequency not the probability		B0
	No probabilities don't stay the same / are about luck		B0
	No it's biased		B0
	No it's an estimate		B0

Q	Answer	Mark	Comments
23(c)	Cannot tell	B1	

Q	Answer	Mark	Comments
24	$\frac{2(3x+1)}{4}$ $\left(\text{and } \frac{x}{4}\right)$	M1	oe common denominator eg $\frac{4(3x+1)}{8}$ and $\frac{2x}{8}$
	$\frac{6x+2}{4}$ $\left(\text{and } \frac{x}{4}\right)$	M1dep	oe brackets expanded eg $\frac{12x+4}{8}$ and $\frac{2x}{8}$ or $\frac{14x+4}{8}$
	$\frac{7x+2}{4}$	A1	
	Additional Guidance		
	$\frac{7x+2}{4}$ followed by further work eg $\frac{7x}{4}+\frac{1}{2}$ or $\frac{3.5x+1}{2}$ or $\frac{1.75x+0.5}{1}$		M1M1A0

Q	Answer	Mark	Comments
25	**Alternative method 1**		
	$1 + \frac{2}{100}$ or 1.02 seen	M1	oe implied by 1.104… implied by 2800 + 2800 × 0.02 or 2856
	$2800 \times (1.02)^5$ or 3091.426…	M1dep	oe eg 2800 × 1.104…
	3091.42 or 3091.43 or 3091.4 or 3091	A1	
	Alternative method 2		
	$1 + \frac{2}{100}$ or 1.02 seen	M1	oe implied by 2800 + 2800 × 0.02 or 2856
	2800 × 1.02 or 2856 and their 2856 × 1.02 or 2913.12 and their 2913.12 × 1.02 or 2971.38(24) and their 2971.38(24) × 1.02 or [3030.8, 3030.81005] and their [3030.8, 3030.81005] × 1.02 or [3091.41, 3091.43]	M1dep	oe must be exactly 5 years
	3091.42 or 3091.43 or 3091.4 or 3091	A1	
	Additional Guidance		
	1 + 2% only		M0
	3091 from an incorrect value eg 3091.21 followed by 3091		A0

Q	Answer	Mark	Comments
26	$2\pi r = 15$ or $\pi d = 15$ or $(d =) \frac{15}{\pi}$ or $(d =)$ [4.77, 4.8] or $(r =) \frac{15}{2\pi}$	M1	oe eg $12\pi r = 90$
	[2.38, 2.39] or 2.4	A1	

Q	Answer	Mark	Comments
27	$5w^{10}$	B2	B1 $\frac{15w^{10}}{3}$ or $\frac{15w^{16}}{3w^6}$ or $\frac{5w^{16}}{w^6}$ or $\frac{15w^{14}}{3w^4}$ or $\frac{5w^{14}}{w^4}$ or $\frac{15w^{12}}{3w^2}$ or $\frac{5w^{12}}{w^2}$
	Additional Guidance		
	Allow unnecessary multiplication signs in a B1 response eg $\frac{15\times w^{16}}{3\times w^6}$		
	$5 \times w^{10}$ or $5.w^{10}$ is B1 unless correct answer also seen		
	B2 response followed by further incorrect work		B1
	B1 response followed by further incorrect work		B1
	Allow division sign for fraction eg $15w^{16} \div 3w^6$		B1
	Allow simplified equivalent expressions eg $\frac{5w^{11}}{w}$		B1

Q	Answer	Mark	Comments
28	3850 ÷ (2 + 5) or 550	M1	oe
	their 550 × 2 or 1100 or their 550 × 5 or 2750	M1dep	1100 is implied by 1400 2750 is implied by 2800
	their 550 × 2 + 300 or 1400 and 3850 + 300 + 50 or 4200 or their 550 × 2 + 300 or 1400 and their 550 × 5 + 50 or 2800 or $\frac{1400}{4200}$ or 1400 : 2800 or 1 : 2	M1dep	oe eg their 550 × 2 + 300 or 1400 and their 550 × 2 + 300 + their 550 × 5 + 50 or 4200
	$\frac{1}{3}$	A1	
	Additional Guidance		
	$\frac{1}{3}$ must be their final answer to award the A mark		
	3850 ÷ 7 = 550 and 3850 ÷ 5 = 770 is choice unless 550 is chosen		

Q	Answer	Mark	Comments
29	$\sin x = \frac{31}{65}$ or $\sin^{-1}\frac{31}{65}$ or $\sin x = \frac{31(\sin 90)}{65}$ or $\tan x = \frac{31}{\sqrt{65^2 - 31^2}}$ or $\cos x = \frac{\sqrt{65^2 - 31^2}}{65}$ or $90 - \cos^{-1}\frac{31}{65}$ or $90 - 61.5(\ldots)$ or $90 - 62$	M1	oe eg $\cos x = \frac{65^2 + \left(\sqrt{65^2 - 31^2}\right)^2 - 31^2}{2 \times \sqrt{65^2 - 31^2} \times 65}$ any letter
	28.(48…) or 28.5	A1	

Additional Guidance

$\sin = \frac{31}{65}$ or $\sin\frac{31}{65}$ or $\sin^{-1} = \frac{31}{65}$ (unless recovered)	M0
Answer from scale drawing	Zero
If using sine rule must rearrange to $\sin x =$ for M1	
If using cosine rule must rearrange to $\cos x =$ for M1	

Q	Answer	Mark	Comments
30(a)	$(x - 3)(x + 5)$	B2	B1 $(x + a)(x + b)$ where $ab = -15$ or $a + b = 2$
	Additional Guidance		
	Ignore any attempt to solve		
	$(x + 5)(x - 3)$		B2
	Condone missing closing bracket ie $(x - 3)(x + 5$ or $(x + 5)(x - 3$		B2
	Allow use of multiplication sign for B2 or B1		
	$(x - 5)(x + 3)$		B1

Q	Answer	Mark	Comments
30(b)	$(x =) -2$ $(x =) 8$	B1	both answers required
	Additional Guidance		
	Roots seen but factorisation given as answer		B0