GCSE

Mathematics

Paper 2 43652F

Mark scheme

43652F

June 2015

Version 1 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 Assessment Writer.

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.

Further copies of this Mark Scheme are available from aqa.org.uk

Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

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. e.g. accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.
[a, b)	Accept values a ≤ value < b
3.14 …	Accept answers which begin 3.14 e.g. 3.14, 3.142, 3.1416
Q	Marks awarded for quality of written communication
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a candidate has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the candidate. In cases where there is no doubt that the answer has come from incorrect working then the candidate should be penalised.

Questions which ask candidates to show working

Instructions on marking will be given but usually marks are not awarded to candidates who show no working.

Questions which do not ask candidates to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Candidates often copy values from a question incorrectly. If the examiner thinks that the candidate has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Paper 2 Foundation Tier

Q	Answer	Mark	Comments
1(a)	Acute	B1	
1(b)	Obtuse	B1	
1(c)	Parallel	B1	
1(d)	Perpendicular	B1	
2(a)	15:50	B1	
2(b)	1 hour 15 minutes or 1:15 or 1.15 or 75 or 1.25 or 8 or 4 or 315 (minutes) or $5\frac{1}{4}$ or 5.25 or 5:15 or 5.15 or 18:30	M1	oe Check programme list
	5 hours 15 minutes	A1	
	Additional Guidance		
	13:15		M0
2(c)	2:30	B1	Swimming and Cricket
	12:15	B1	End of Highlights
	Additional Guidance		
	14:30, 14:30, 00:15		B0B0

Q	Answer	Mark	Comments
3	True	B1	
	False	B1	
	False	B1	
4	4 correct connections	B2	All 4 correct B2 2 or 3 correct B1
	Additional Guidance		
	From left to right: cylinder, hexagon, rhombus and cuboid		
5	Blue 4	B1	
	White 3 and Yellow 1	B1	
6(a)	15	B1	

Q	Answer	Mark	Comments
6(b)	6 circles drawn for the 3rd shape	B1	Any orientation or shape
	8 circles drawn for the 4th shape	B1	Any orientation or shape SC1 Shape 4 has 2 more circles than shape 3
	Additional Guidance		
	Count the number of circles and ignore what the shape looks like 5 circles for Pattern 3 and 7 circles for Pattern 4		SC1
7(a)	30 or 43 or 25	M1	
	98	A1	Answers may be on the diagram

Q	Answer	Mark	Comments
7(b)	$5\frac{1}{2}$ symbols drawn for beds	B1	
	Chairs = 60 or 6 symbols drawn for chairs or Tables = 40 or 4 symbols drawn for tables or 155 – 55 or 100 seen or implied or chairs and tables add up to 100 or 10 symbols for chairs and tables or their number of chairs equals their number of tables plus 20	M1	
	6 symbols drawn for chairs and 4 symbols drawn for tables	A1	
	$5\frac{1}{2}$ symbols drawn for beds and 6 symbols drawn for chairs and 4 symbols drawn for tables and all symbols drawn match their key	Q1	Strand (ii) Lengths of rows consistent with number of symbols SC2 for fully correct pictogram with the 10 changed in the key
	Additional Guidance		
	The M mark can be awarded from the table or the pictogram regardless of any contradictions, eg 70 and 30 in the table, 7 symbols and 2 symbols for chairs and tables in the pictogram scores the M1 Accept any symbol for the first three marks, even if they have used 3 different symbols, eg 5½ beds, 6 chairs and 4 tables would score 3 marks out of 4 Half symbols can be open or closed For the Q mark, the pictogram must be fully correct and chairs must be the longest row, beds the next longest and tables must be the shortest row For the Q mark if another symbol is used, it must be the only symbol used and it must be defined in the key		

Q	Answer	Mark	Comments
8(a)	T	B1	
8(b)	R	B1	
	Q	B1	
9(a)	120 for D or 60 for E or 60 for F and C or 40 for F $\frac{30}{360}$ or 30 ÷ 360 or $\frac{360}{30}$ or 360 ÷ 30 or 12 or $\frac{240}{12}$ or 240 ÷ 12 or $\frac{60}{3}$ or 60 ÷ 3 or $\frac{360}{240}$ or 1.5 or $\frac{240}{360}$ or 0.67 or 0.66(…)	M1	oe
	20	A1	
	Additional Guidance		
	0.67 × 30 = 20.1, answer 20		M1A1
	0.66 × 30 = 19.8, answer 20		M1A1
	60 × 0.3 = 18, answer 20 (M1 for the 60)		M1A0
	60 × 0.3, answer 20 (M1 for the 60)		M1A0
	Answer 20%		M1A0
	Answer 20º		M1A0

Q	Answer	Mark	Comments
9(b)	$\frac{60}{360}$ or $\frac{40}{240}$ or 60 ÷ 360 or 40 ÷ 240 or 0.16(…) or 0.17	B1	oe
	$\frac{1}{6}$	B1ft	ft for simplifying their fraction fully Note $\frac{1}{6}$ with no working scores 2 marks
	Additional Guidance		
	The second B1 is for simplifying their fraction fully No follow through from part a Ignore attempts to convert $\frac{1}{6}$ to decimal or percentage		
	Answer 1 out of 6 Answer 1 in 6		B1 B0 B1 B0
	$\frac{30}{360} = \frac{1}{12}$		B0 B1ft
	$\frac{90}{360} = \frac{1}{4}$		B0 B1ft
	$\frac{20}{240} = \frac{1}{12}$		B0 B1ft
	$\frac{60}{240} = \frac{1}{4}$		B0 B1ft
	$\frac{120}{240} = \frac{1}{2}$		B0 B1ft
	$\frac{60}{90} = \frac{2}{3}$		B0 B1ft
	$\frac{60}{240} = \frac{30}{120}$		B0 B0

Q	Answer	Mark	Comments
10(a)	$15x$ or $15 \times x$ or $x \times 15$	B1	oe
	Additional Guidance		
	Condone the use of a different letter, but not p		
	$15r$ or $15 \times r$ or $r \times 15$		B1
	$15x$ pence		B1
	$15xp$ or $15p \times x$ or $x \times 15p$		B1
	cost = $15x$ or c = $15x$ or price = $15x$ etc		B1
	$15p$		B0
	$15 \times p$		B0
	$x15$		B0
	$15x = x$		B0

Q	Answer	Mark	Comments
10(b)	$30y + 120w$ or $30(y + 4w)$	B2	oe B1 for $30y$ or $120w$ or $0.3y + 1.2w$ Do not ignore fw for B2 SC1 for $30p + 120c$

Additional Guidance

$30yp + 120wp$	B2
$30p + 120w$	B1
$30y = 120w$	B1
$0.3y + 120w$	B1
$30y + 1.20w$	B1
$30y + w120$	B1
$30y + 120w = 150yw$	B1
$30w + 120y$	B0
$30a + 120b$	B0
$y30 + w120$	B0
$30p + 120p$	B0
$30py + 120pw$	B0
Use of letters other than y or w is B0 Ignore p as units	

Q	Answer	Mark	Comments
10(c)	5 – 1.35 or (£)3.65 or 500 – 135 or 365 or subtract any 3 items from (£)5 with an answer given or add any 3 items with an answer given	M1	
	their 3.65 or 365 and an attempt to add any 3 items with an answer given or subtract any 2 or 3 items from their 3.65 or 365 with an answer given or add the correct 3 items to 1.35 or 135 or subtract the correct 3 items from (£)5 or 500	M1dep	
	Pen, calculator and calculator in any order	A1	oe Accept 1.25, 1.20, and 1.20 Accept 2 calculators and 1 pen in any order SC2 for any combination using 3 of the 4 things that the shop sells that adds up to 3.65 eg 1 pen, 1 calculator, 4 protractors
	Additional Guidance		
	5 – 1.25 – 1.20 – 1.20 with no answer given		M1M1A0
	1 pen, 1 calculator, 4 protractors		SC2
	8 rulers, 1 calculator, 1 pen		SC2
	Answers given do not have to be correct for method marks		
	Units need to be consistent		

Q	Answer	Mark	Comments	
10(d)	1.25 + 0.15 + 0.30 + 1.20 or 2.90 seen or 125 + 15 + 30 +120 or 290 seen	M1	oe	
	20 ÷ their 2.9 or [6.8, 6.9] or 2000 ÷ their 290 or 6 × 2.9 or 17.4 or 7 × 2.9 or 20.3 or x × their 2.9 or $(x + 1)$ × their 2.9 where x × their 2.9 ≤ 20 ≤ $(x + 1)$ × their 2.9	M1dep	oe	
	6	A1		
	Additional Guidance			
	1.25 + 0.15 + 0.30 + 1.20 = 2.95, 20 ÷ 2.95 = 6.78, answer 6			M1M1A0
	1.25 + 0.15 + 0.30 + 1.20 = 2.40, 8 × 2.40 = 19.20, answer 8			M1M1A0
	1.25 + 0.15 + 0.30 + 1.20 = 2.40, 9 × 2.40			M1M1A0
	6 scores full marks unless clearly from wrong working			

Q	Answer	Mark	Comments
11(a)	$\frac{3}{5}$ × 180 or 108 or $\frac{1}{4}$ × 180 or 45 or $\frac{3}{5} \times \frac{1}{4}$ or $\frac{3}{20}$	M1	oe
	$\frac{1}{4}$ × 108 or $\frac{3}{5}$ × 45 $\frac{3}{5} \times \frac{1}{4} \times 180$ or $\frac{3}{20} \times 180$	M1dep	oe
	27	A1	
	Additional Guidance		
	$\frac{1}{4}$ of 108		M1M0A0
	$\frac{1}{4}$ of 108 = 27 (recovered)		M1M1A1
	$\frac{3}{5}$ of 180 (unless recovered)		M0M0A0

Q	Answer	Mark	Comments
11(b)	$\frac{30}{100} \times 180$ or $\frac{70}{100} \times 180$ or 126	M1	oe
	54	A1	
	Additional Guidance		
	Answer 54%		M1A0
12	2 or 4 or 7 or 8 or 10 or 7 and 9 and 2 and 3 and 5 or 37 and 39 and 42 and 43 and 45 or 206 or 5 × 35 or 175	M1	oe Check diagram
	2 + 4 + 7 + 8 + 10 or 31 or 2 × 1.45 or 2.9 or 4 × 1.45 or 5.8 or 7 × 1.45 or 10.15 or 8 × 1.45 or 11.6 or 10 × 1.45 or 14.5 or (37 + 39 + 42 + 43 + 45) – (5 × 35) or 206 – 175 or 31 or 206 × 1.45 or 298.70	M1dep	oe
	their 31 × 1.45 or 2.9 + 5.8 + 10.15 + 11.6 + 14.5 or (206 × 1.45) – (175 × 1.45)	M1dep	oe
	44.95	A1	SC2 for 35.50 SC1 for 35.5
	Additional Guidance		
	7, 9, 2, 3 and 5 can be indicated on the diagram 4495		M1M1M1A0

Q	Answer	Mark	Comments
13(a)	10:00	B1	oe
13(b)	Leicester 08:27 Leicester 09:23 Leicester 09:33 10:34	B4	B3 for 07:41 Leicester 08:52 Leicester 09:33 10:34 B2 for 06:47 Leicester 07:52 Leicester 08:33 09:34 B2 for 06:47 Leicester 07:52 Leicester 09:33 10:34 B2 for 06:47 Kettering 08:14 Kettering 08:56 09:34 B2 for 06:47 Kettering 08:14 Kettering 09:56 10:34

Question 13(b) continues on the next page

Q	Answer	Mark	Comments
13(b) cont			B2 for 06:47 Leicester 07:52 Depart Leicester 08:33 Arrive Kettering 08:56 Kettering 09:56 10:34 B1 for 09:27 Leicester 10:23 Leicester 10:33 11:34 SC2 Start 8.27, finish 10.34, change Leicester SC1 10.34 finish
	Additional Guidance		
	Place name or a time missing deduct 1 mark from the B marks Accept 8.27 for 08:27 etc		

Q	Answer	Mark	Comments
14	Correct ruled line across at least 5cm squares wide	B4	tolerance ± ½ small square B3 Correct ruled line less than 5cm squares wide or At least 2 correct points plotted and no incorrect points with no line or incorrect line B2 At least 2 correct points plotted and some incorrect points with no line or incorrect line or At least 2 correct points calculated B1 1 correct point plotted or calculated
	Additional Guidance		
	Here are some correct conversions: (0, 32) (5, 41) (10, 50) (15, 59) (20, 68) (25, 77) (30, 86) (35, 95) **For B1, if calculation not seen the point must be clearly identified, and is not implied by any line, but (0, 32) can be implied by their line** A correctly plotted point implies a correct calculation Mark the line first, if the line is correct ignore incorrect points 2 or more lines, joined or not joined, scores a maximum of B2 Bar charts are B0 unless correct points are clearly marked Vertical line graphs can indicate correct points using the top of each line		

Q	Answer	Mark	Comments
15	6 (cm) or 4.5 (cm)	B1	oe Accept 60 (mm) or 45 (mm)
	their 6 – their 4.5 or 1.5	M1	oe
	$\frac{\text{their 6}}{\text{their 1.5}} \times 20$ or $\frac{\text{their 4.5}}{\text{their 1.5}} \times 20$ or 60	M1dep	oe
	80	A1	
	Additional Guidance		
	Answer 80 with or without units implies full marks For the B mark accept no units or correct units, but not incorrect units Beware of 60 as it could be the height of the smaller building or it could be the measurement of the larger building in millimetres 60 as the height of the smaller building 60 with no working 60 mm with no other working 1.5 **Check the diagram**		 B1M1M1A0 B1M1M1A0 B1M0M0A0 B1M1

Q	Answer	Mark	Comments
16(a)	**Alternative Method 1**		
	4 × 4 × 5 × 3 × 1.98	M3	Allow one omission M2 for 4 × 4 × 5 × 3 × 1.98 with two omissions M1 for one correct product
	£475.20	A1	
	Additional Guidance		
	1 omission – all M3 4 × 5 × 3 × 1.98 or 118.8 4 × 4 × 3 × 1.98 or 95.04 4 × 4 × 5 × 1.98 or 158.4 4 × 4 × 5 × 3 or 240 2 omissions – all M2 5 × 3 × 1.98 or 29.7 4 × 3 × 1.98 or 23.76 4 × 5 × 1.98 or 39.6 4 × 5 × 3 or 60 4 × 4 × 1.98 or 31.68 4 × 4 × 3 or 48 4 × 4 × 5 or 80 Any 1 correct product – all M1 4 × 4 or 16 4 × 5 or 20 4 × 3 or 12 4 × 1.98 or 7.92 5 × 3 or 15 5 × 1.98 or 9.9 3 × 1.98 or 5.94		

Question 16(a) continues on the next page

Q	Answer	Mark	Comments
16(a) cont	**Alternative Method 2**		
	0.25 × 0.25 or 0.0625 or 5 × 3 or 15 or 5 ÷ 0.25 or 20 or 3 ÷ 0.25 or 12	M1	oe 25 × 25 or 625 or 500 × 300 or 150 000 or 500 ÷ 25 or 20 or 300 ÷ 25 or 12
	their 15 ÷ their 0.0625 or 5 ÷ 0.25 and 3 ÷ 0.25 or 20 and 12	M1dep	their 150 000 ÷ their 625
	their 240 (× 1.98) or 475.2 or their 20 x their 12 (× 1.98)	M1dep	
	(£)475.20	A1	Correct money notation
	Additional Guidance		
	Condone (£)475.20p		

Q	Answer	Mark	Comments
16(b)	**Alternative Method 1**		
	6 × 6 – 5 × 5 or 36 – 25 or 11	M1	
	390 ÷ (6 × 6) or 10.83(…) or 390 × 11 or 4290	M1	oe
	their 10.83(…) × their 11 or 119.166(…) or their 4290 ÷ 36	M1dep	or their 10.83(…) × (36 – 25)
	[119.00, 119.25]	Q1	Strand (i) correct money notation Accept 119
	Alternative Method 2		
	390 ÷ (6 × 6) or 10.83(…)	M1	
	(5 × 5) × their 10.83(…) or [270.75, 271)	M1	oe
	390 – their [270.75, 271)	M1dep	
	[119.00, 119.25]	Q1	Strand (i) correct money notation Accept 119

Q	Answer	Mark	Comments
17(a)	180 – 100 or 80	M1	
	40	A1	
	Additional Guidance		
	Embedded answer 100 + 2 × 40 = 180		M1A0
17(b)	360 ÷ 8 or 135 seen	M1	oe 180 – [[(8 – 2) × 180] ÷ 8]
	45	A1	
	Additional Guidance		
	90 ÷ 2 = 45 is a valid method using symmetry		M1A1
17(c)	Angle *ABD* is 90 or angle *ADB* = w seen or implied or angle *ADB* = angle *CBD* seen or implied or angle *BCD* is 65 or angle *ABC* is 180 – 65 or 115 or angle *ADC* is 180 – 65 or 115 or 155 seen	M1	oe (360 – 65 – 65 – 90 – 90) or 50 May be on diagram
	180 – 65 – 90 or 180 – 155 or 115 – 90 or angle *ADB* is 25	M1dep	oe (360 – 65 – 65 – 90 – 90) ÷ 2 or 50 ÷ 2 or 90 – 65
	25	A1	
	Additional Guidance		
	For the first M1 angles must be clearly identified either in the diagram or in the working Use of the right angle symbol is acceptable for 90 May extend side to obtain a valid angle Working space takes precedence over diagram		

Q	Answer	Mark	Comments
18	850 × 1.18 or 1003	M1	oe (990 + 15) ÷ 1.18 or 990 ÷ 1.18 or 838.9(…)
	1003 and 1005 or 2	A1	851.(…) or 852 or 1.(…)
	Laura and 1003 and 1005 or Laura and 2 or UK and 1003 and 1005 or UK and 2 or Laura and 851.(…) or 852 or Laura and 1.(…) or UK and 851.(…) or 852 or UK and 1.(…)	Q1ft	Strand (iii) decision to match their calculation ft their comparison of values with M1 scored, both values must be in the same currency
	Additional Guidance		
	Accept name, country or price (e.g. the (£)850 saddle) for final answer		
	990 ÷ 1.18 = 838.(…), Steve (or Holland)		M1A0Q1ft
	990 ÷ 1.18 = 838.(…), 15 ÷ 1.18 = 12.(…), 838 + 12 = 850, they both cost the same		M1A0Q1ft
	Laura with no valid working		M0A0Q0
	For the Q mark, follow through their comparison of values with M1 scored, but both values must be in the same currency and one of the values used in the comparison must be from the M1 that was awarded		

Q	Answer	Mark	Comments
19(a)	$6x - 3 + 2x - 6$ or $8x$ or -9	M1	Allow one error
	$8x - 9$	A1	Do not ignore fw
	Additional Guidance		
	$8x + - 9$ 4 correct terms seen $8x - 9$, followed by an equation solved or unsolved eg $8x - 9 = -x$ or $8x - 9 = 0$, $8x = 9$, $x = \frac{9}{8}$		M1A0 M1 M1A0
19(b)	$\frac{3}{2} < n \leq 5$ or 2, 3, 4 or 2, 4, 5 or 2, 3, 5 or 3, 4, 5 or 1, 2, 3, 4, 5 or 2, 3, 4, 5, 6	M1	
	2, 3, 4, 5	A1	SC1 for 4, 5, 6, 7, 8, 9 and 10
	Additional Guidance		
	4, 5, 6 Embedded answers are ambiguous so M0		M0 M0

Q	Answer	Mark	Comments
19(c)	$12x - 20$	B1	oe $\frac{22}{4}$ or 5.5 or $3x - 5 = \frac{22}{4}$ or $x - \frac{5}{3} = \frac{22}{12}$
	$12x = 22 + 20$ or their $12x$ = 22 + their 20	M1	oe $3x$ = their $\frac{22}{4} + 5$ or $x = \frac{22}{12} + \frac{5}{3}$
	$\frac{42}{12}$ or $\frac{7}{2}$ or 3.5	A1ft	oe ignore fw On ft accept answers to 1dp or better
	Additional Guidance		
	$12x - 5 = 22$, $12x = 22 + 5$, $x = \frac{27}{12}$		B0M1A1ft
	$12x - 20 = 22$, $12x = 22 + 20$, $x = \frac{44}{12}$		B1M1A0
	$7x - 9 = 22$, $7x = 22 + 9$, $x = \frac{31}{7}$		B0M1A1ft
	$12x - 20 = 22$, $12x = 44$, $x = \frac{44}{12}$		B1M0A0
	T&I scores 3 or 0		

Q	Answer	Mark	Comments
20	$\frac{150}{800}$ (× 100) or $\frac{150}{650+150}$ (× 100) or 0.1875	M1	oe
	18.75 or 18.8 or 19	A1	oe SC1 for 81.25 or 81 or 81.3
	Additional Guidance		
	$\frac{800}{150}$ 19 with no working 19 is incorrect only if clearly from wrong working Build up methods score 0 or 2		M0 M1A1

21(a)	720 ÷ 6 or 120	M1	720 ÷ 6 × 5 or 600
	600 and 120	A1	
	Additional Guidance		
	120 and 600 (order reversed)		M1A0

Q	Answer	Mark	Comments
21(b)	135 + 70 + 35 or 240	M1	
	their 240 ÷ 6 or 40	M1dep	
	2 × their 40 or 80	M1dep	
	10	A1	ignore fw
	Additional Guidance		
	Gemma 10, Beth 5, answer 15 scores full marks		M1M1M1A1
	(120 and) 80 and 40 may be written next to the 3 : 2 : 1 in the question		M1M1M1A0
	Beware of 10 from incorrect working		
	eg 135 ÷ 3 = 45, 70 ÷ 2 = 35, 35 ÷ 1 = 35, answer 10 scores 0		M0M0M0A0
22	$\frac{1}{3}$ or $\frac{2}{6}$ or 0.33(…) or 72 ÷ 6 or 12 or 72 ÷ 6 × 2	M1	oe
	24	A1	oe
	Additional Guidance		
	24 out of 72		M1A1
	$\frac{24}{72}$		M1A0
	2 out of 6 or 1 out of 3		M0

Q	Answer	Mark	Comments
23	(Diameter or side of square =) $\sqrt{36}$ or 6 or (radius =) 3	M1	6 × 6 (= 36)
	π × 6 or 2 × π × 3	M1dep	
	[18.8, 18.9] or 6π	A1	Accept 19 with working shown
	Additional Guidance		
	Accept [3.14, 3.142] for π Ignore further working after 6π, that is if they incorrectly work 6π out award full marks Do not accept π6 for the A mark 6 or 3 may be on diagram but must be correct, eg radius must be 3, not 6		

Q	Answer	Mark	Comments
24	$2x + 2x - 10 + x + 25 + 2x + 30$ or $ax + 45$ or $7x + b$	M1	Allow one error in their 7 terms oe 25 + 30 – 10 or 45
	$2x + 2x - 10 + x + 25 + 2x + 30 = 360$ or $7x + 45$ or their $ax + 45 = 360$ or their $7x + b = 360$	M1dep	oe 360 – their 45 or 315
	$7x + 45 = 360$	M1dep	oe their 315 ÷ 7
	45	A1	
	Additional Guidance		
	$x = 45$ with no working		M3A1
	$45 + 315 = 360$, $\frac{315}{7} = 45$		M3A1
	$2x = 90$, $x = 45$ (no incorrect working seen)		M3A1
	$360 - 45 = 215$, $\frac{215}{7} = 30.714$		M3A0
	$45 + 215 = 360$, $\frac{215}{7} = 30.714$		M3A0
	Embedded answer		M3A0
	Beware of 25 + 30 – 10 = 45		M1