



GCSE Mathematics

Grades 3-4 Resource Calc Test 2

Mark scheme

8300 Grades 3-4 Resource Calc Test 2

Version: 1.0

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.

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. eg accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between a and b inclusive.
[a, b)	Accept values $a \leq \text{value} < b$
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.

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

Questions which ask students to show working

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

Questions which do not ask students to show working

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

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student 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.

Continental notation

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the student intended it to be a decimal point.

Question	Answer	Mark	Comments
1(a)	$\frac{13}{9}$	B1	oe improper fraction
	Additional Guidance		
	$\frac{13}{9}$ in working with a decimal on answer line		B0
1(b)	2.8	B1	
	Additional Guidance		
	2.80		B0

Question	Answer	Mark	Comments
2	125 and 17 or 5^3 and 17 or 5 and 5 and 5 and 17	B2	together in any order eg 125×17 or 17×5^3 or 5, 5, 5, 17 or $2125 \div 17 = 125$ or $2125 \div 125 = 17$ B1 at least three of 8, 27, 64, 125, 216, 343, 512, 729, 1000, 1331, 1728, 2197 etc (allow $2^3, 3^3, 4^3$ etc) or all four of 11, 13, 17, 19 (ignore any numbers not between 10 and 20) or (cube number > 1) $\times$ (prime number between 10 and 20) or $2125 \div$ (cube number > 1) or $2125 \div$ (prime number between 10 and 20)
	Additional Guidance		
	B1 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts		
	B2 responses may be seen on a factor tree		
	B1 for three cube numbers given in index form – evaluations can be ignored eg 4^3 5^3 6^3 scores B1 with no evaluations or with incorrect evaluations		
	B1 for multiplications or divisions – evaluation can be ignored eg1 $2^3 \times 13$ scores B1 with no evaluation or evaluated incorrectly eg2 $2125 \div 27$ scores B1 with no evaluation or evaluated incorrectly eg3 $2125 \div 11$ scores B1 with no evaluation or evaluated incorrectly		
	125 and 17 seen in multiple attempts is B2 if 2125 included eg $125 \times 17 = 2125$ or $2125 \div 17 = 125$ or $2125 \div 125 = 17$ seen amongst multiple attempts	B2	
	125 and 17 seen in multiple attempts is B1 if 2125 not included eg 125×17 seen amongst multiple attempts	B1	
	11 13 15 17 19 does not score B1 unless 11 13 17 19 selected		
	Incomplete list eg 11 13 19 does not score B1		

Question	Answer	Mark	Comments
3	Alternative method 1		
	10.8×8 or 86.4	M1	
	$50 \times 110 \times 35$ or 192 500	M1	Must use correct volume formula
	their $192\,500 \div 1000$ or 192.5	M1dep	dep on 2nd M1
	their $192.5 - \text{their } 86.4$	M1dep	dep on M1M1M1
	106.1 or 106	A1	
	Alternative method 2		
	$10.8 \times 8 \times 1000$ or 86 400	M1	oe
	$50 \times 110 \times 35$ or 192 500	M1	Must use correct volume formula
	their $192\,500 - \text{their } 86\,400$ or 106 100	M1dep	dep on M1M1
	their $106\,100 \div 1000$	M1dep	dep on M1M1M1
	106.1 or 106	A1	
	Additional Guidance		
	192.5	2ndM1M1dep	
	106 100	M1M1M1dep	
	$50 \times 110 \times 35 = 192\,500 \div 2$	2ndM0	

Question	Answer	Mark	Comments
4	Alternative method 1		
	$360 - 108$ or 252	M1	oe eg $360 \div 5 + 180$ may be on diagram
	their 252×5	M1dep	oe eg $5 \times (180 - 108) + 5 \times 180$ or $5 \times 72 + 5 \times 180$ or $5 \times (72 + 180)$
	1260	A1	SC1 answer 540
	Alternative method 2		
	5×360 or 1800 and 5×108 or 540	M1	
	$5 \times 360 - 5 \times 108$ or $1800 - 540$	M1dep	oe
	1260	A1	SC1 answer 540
	Additional Guidance		
	Allow 252 seen on the diagram or in the working even if not used		M1

Question	Answer	Mark	Comments
5	Alternative method 1		
	Pair of integers in the ratio 5 : 4 between 20 : 16 and 75 : 60 or list of multiples of 9 with at least 3 correct including 63 or $63 \div 9 = 7$ or $63 \div 7 = 9$ or $9 \times 7 = 63$	M1	20 and 16 or 25 and 20 or 30 and 24 or 35 and 28 or 40 and 32 or 45 and 36 or 50 and 40 or 55 and 44 or 60 and 48 or 65 and 52 or 70 and 56 or 75 and 60
	63	A1	
	Alternative method 2		
	An integer [60, 70] divided in the ratio 5 : 4 eg $65 \div 9 \times 5$ and $65 \div 9 \times 4$	M1	if no method seen, values must be rounded or truncated to at least 1 dp eg 65 and 36.1 and 28.8 or 28.9
	63	A1	
	Additional Guidance		
	Up to M1 may be awarded for correct work with no answer, or incorrect answer, even if this is seen amongst multiple attempts		
	M1 pairs of responses may be seen in a ratio		
	Answer 35 : 28		M1A0
	63 seen in list of multiples eg 27, 36, 45, 54, 63, ... but not selected as the answer		M1A0
	63 from incorrect method with no M1 response seen		M0A0
	Alt 2 eg $65 \div 9 = 7.2$ with 36 and 28.8 implies multiplication by 5 and 4 (because it follows through from their answer to the correct division)		M1A0
	Alt 2 eg $65 \div 9 = 7.2$ with 36.1 and 28.8 or 28.9 implies multiplication by 5 and 4 (may have kept full value on calculator)		M1A0
	Alt 2 eg 65 and no working with 36 and 28.8 does not imply the method (because these are not rounded or truncated to at least 1 dp)		M0A0

Question	Answer	Mark	Comments
6	Alternative method 1 Words per minute or words per second		
	$416 \div 8$ or 52	M1	oe eg $416 \div (8 \times 60)$ or $416 \div 480$ or $\frac{13}{15}$ or [0.86, 0.87] or 0.9
	1534 $\div$ their 52 or $(1534 - 416) \div \text{their } 52 + 8$ or 29.5	M1dep	oe eg $1534 \div \text{their } [0.86, 0.87]$ or $(1534 - 416) \div \text{their } [0.86, 0.87] + 8 \times 60$ or 1770
	29 minutes 30 seconds	A1	SC2 29 minutes 50 seconds or 29 minutes 5 seconds
	Alternative method 2 Minutes per word or seconds per word		
	$8 \div 416$ or $\frac{1}{52}$ or [0.019, 0.019231] or 0.02	M1	oe eg $8 \times 60 \div 416$ or $480 \div 416$ or $\frac{15}{13}$ or [1.15, 1.154] or 1.2
	$1534 \times \text{their } [0.019, 0.019231]$ or $(1534 - 416) \times$ their [0.019, 0.019231] + 8 or 29.5	M1dep	oe eg $1534 \times \text{their } [1.15, 1.154]$ or $(1534 - 416) \times \text{their } [1.15, 1.154]$ + 8×60 or 1770
	29 minutes 30 seconds	A1	SC2 29 minutes 50 seconds or 29 minutes 5 seconds

Mark scheme and Additional Guidance continue on the next page

Question	Answer	Mark	Comments
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6 cont	Alternative method 3 Essay words ÷ report words		
	$1534 \div 416$ or $\frac{59}{16}$ or [3.68, 3.69] or 3.7 or $(1534 - 416) \div 416$ or [2.68, 2.69] or 2.7	M1	oe
	$8 \times$ their [3.68, 3.69] or $8 \times$ their [2.68, 2.69] + 8 or 29.5	M1dep	oe eg $8 \times 60 \times$ their [3.68, 3.69] or $8 \times 60 \times$ their [2.68, 2.69] + 8×60 or 1770
	29 minutes 30 seconds	A1	SC2 29 minutes 50 seconds or 29 minutes 5 seconds
	Additional Guidance		
	M1 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts		
	Answer 29.5 minutes 1770 seconds		M1M1A0
	Build-up method must be a fully correct method that would lead to 29.5		
	If working with report words ÷ essay words apply the principles of Alt 3		

7(a)	$10cd + 5c$ or $10dc + 5c$ or $5c + 10cd$ or $5c + 10dc$	B2	B1 fully simplified first term ie $10cd$ or $10dc$ or correct expansion not fully simplified eg $10 \times cd + 5c$ or $5c \times 2d + 5c (\times 1)$ or $5c2d + 5 \times c$
	Additional Guidance		
	Further incorrect work after a B2 response is B1 eg $10cd + 5c = 15cd$		B1
	Further incorrect work after a B1 response is still B1 eg $10cd + 1 = 11cd$		B1

Question	Answer	Mark	Comments
7(b)	$7(3x + 4)$	B1	
	Additional Guidance		
	Condone missing final bracket ie $7(3x + 4$		B1
	Allow multiplying back out to check their answer		
	Further incorrect work after a correct response is B0 eg $7(3x + 4) = 7(7x)$		B0
	$7(x3 + 4)$		B0
	$7 \times (3x + 4)$		B0

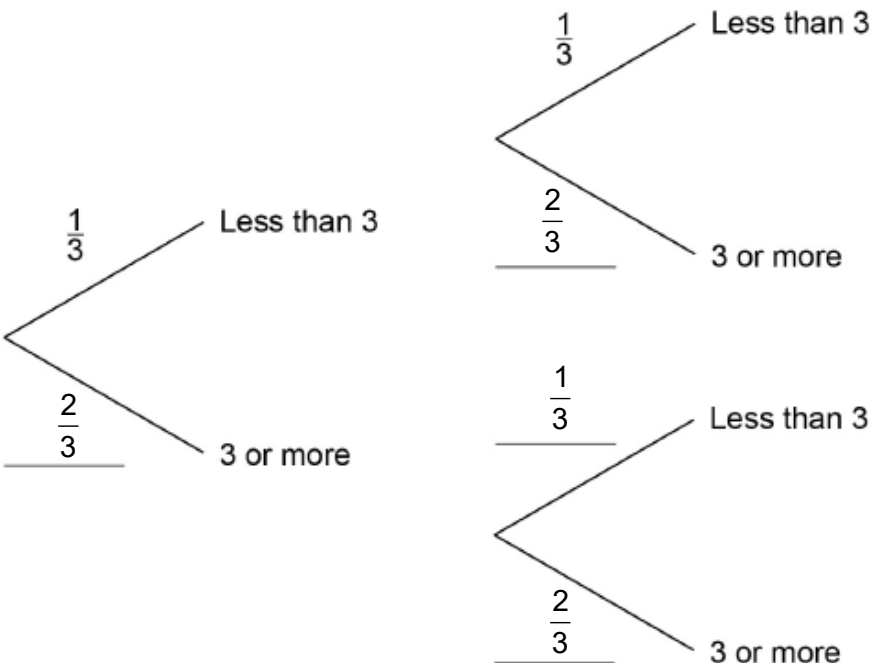
8	90 seen or [88°, 92°] drawn on pie chart	M1	allow missing or incorrect label
	$\frac{20}{60} \times 360$ or 120 seen or [118°, 122°] drawn on pie chart	M1	oe eg $360 \div 3$ allow missing or incorrect label
	Fully correct pie chart with unambiguous labels and all angles $\pm 2^\circ$	A1	
	Additional Guidance		
	All three labels (or a key) needed for the A1 but accept eg No, Yes, Rest or N, Y, M or N, Y, R eg for No do not accept 15 (people) or $\frac{1}{4}$ or 90 as the label		
	Not using the given radius will score a maximum of M2		

Question	Answer	Mark	Comments
9	$\frac{90 - 42}{100} \times 24\,000$ or $\frac{48}{100} \times 24\,000$ or 11 520 or $\frac{42}{100} \times 24\,000$ or 10 080 or $\frac{48 - 42}{100} \times 24\,000$ or 6 and 48 and 42 seen	M1	oe
	1440	A1	SC1 1920 or answer with digits 144
	Additional Guidance		
	Up to M1 may be awarded for correct work with no answer, or incorrect answer, even if this is seen amongst multiple attempts		
	Build-up to 48% or 42% must be correct or full method must be shown		
	eg only $48\% \times 24\,000$ with no or incorrect evaluation		M0

Question	Answer	Mark	Comments
10	Alternative method 1		
	$10x - 5$	M1	may be seen in a grid
	their $10x - 6x = 9 +$ their 5 or $4x = 14$ or $14 \div 4$ or $7 \div 2$	M1	oe eg their $-5 - 9 = 6x -$ their $10x$ or $4x - 14 = 0$ collecting two terms in x and two constant terms correctly
	$\frac{14}{4}$ or $3\frac{2}{4}$ or $\frac{7}{2}$ or $3\frac{1}{2}$ or 3.5	A1ft	oe ft M1M0 or M0M1 with exactly one error
	Alternative method 2		
	$\frac{6x}{5} + \frac{9}{5}$	M1	oe two terms eg $1.2x + 1.8$
	$2x -$ their $\frac{6x}{5} =$ their $\frac{9}{5} + 1$ or $\frac{4x}{5} = \frac{14}{5}$	M1	oe eg $-1 -$ their $\frac{9}{5} =$ their $\frac{6x}{5} - 2x$ or $\frac{4x}{5} - \frac{14}{5} = 0$ collecting two terms in x and two constant terms correctly
	$\frac{14}{4}$ or $3\frac{2}{4}$ or $\frac{7}{2}$ or $3\frac{1}{2}$ or 3.5	A1ft	oe ft M1M0 or M0M1 with exactly one error

Additional Guidance is on the next page

10 cont	Additional Guidance	
	Ignore simplification or conversion if correct answer seen	
	Correct answer from trial and improvement	M1M1A1
	Correct equation with terms collected or division with no or incorrect answer	M1M1A0
	Embedded 3.5 with no or incorrect answer	M1M1A0
	$10x - 5 = 6x + 9$ $10x - 6x = 9 - 5$ $x = 1$ (exactly one error in line 2)	M1 M0 A1ft
	$7x - 5 = 6x + 9$ $7x - 6x = 9 + 5$ $x = 14$ (exactly one error in line 1)	M0 M1 A1ft
	$10x - 5 = 6x + 9$ $10x + 6x = 9 - 5$ $x = \frac{4}{16}$ (two errors in line 2)	M1 M0 A0ft
	$10x - 1 = 6x + 9$ $10x - 6x = 9 + 1$ $x = 3$ (exactly one error in line 1 but answer does not ft)	M0 M1 A0ft
	$7x - 6 = 6x + 9$ $7x - 6x = 9 + 6$ $x = 15$ (two errors in line 1)	M0 M1 A0ft
	$10x + 4 = 6x + 9$ $10x - 6x = 9 + 4$ $x = 3.25$ (neither M mark scored)	M0 M0 A0ft
	$10x - 5 = 30x + 45$	M1M0A0ft
	Any ft answer must be rounded or truncated to 1 dp or better	
	The last two marks can be implied without the collection of terms seen eg $10x - 1 = 6x + 9$ and $x = 2.5$	M0M1A1ft
	Collecting terms before the bracket has been expanded	M0M0A0ft

Question	Answer	Mark	Comments
11	$\frac{1}{3}$ or $\frac{2}{6}$ or 0.33... or 33.(...)% on each top branch and $\frac{2}{3}$ or $\frac{4}{6}$ or 0.66... or 0.67 or 66.(...)% or 67% on each bottom branch	B1	accept any equivalent fraction, decimal or percentage
	Additional Guidance		
	Decimals must have at least 2 decimal places so do not accept 0.3 or 0.6 or 0.7		
	Only accept the percentages shown, do not accept 30% or 60%		
	Ignore working around the edge of the diagram		
			B1

Question	Answer	Mark	Comments
12	8^2 and 3^2 seen or 8×8 and 3×3 seen or 64 and 9 seen or 55	M1	M2 for $\sin^{-1}\left(\frac{3}{8}\right) = 22.(\dots)$ and $8 \cos$ (their $22.(\dots)$) or $\cos^{-1}\left(\frac{3}{8}\right) = 67.(\dots)$ or 68 and $8 \sin$ (their $67.(\dots)$)
	$\sqrt{8^2 - 3^2}$ or $\sqrt{64 - 9}$ or $\sqrt{55}$	M1dep	
	[7.4, 7.42]	A1	
	Additional Guidance		
	$\sqrt{8^2 + 3^2}$ or $\sqrt{64 + 9}$ or $8^2 + 3^2$ or $64 + 9$		M1M0depA0
	Only $\sqrt{73}$ or only 73 or only 8.5...		M0
	If trigonometry used it must be a fully correct method that would lead to the correct value of x		
	Partial method using trigonometry		M0
	Ignore units given		
	8 cm ² is not 8^2 unless recovered		
	Correct answer in range seen, ignore further work if truncates or rounds		M2A1
	$8^2 = 16$ and $3^2 = 6$, $\sqrt{16 - 6}$		M1M1depA0
13	Scale drawing with answer in range [7.4, 7.42]		M2A1
	Scale drawing with answer not in range [7.4, 7.42]		M0
13	1 : 4	B1	

Question	Answer	Mark	Comments
14	$\begin{pmatrix} 11 \\ 19 \end{pmatrix}$	B2	B1 unsimplified equivalent single vector eg $\begin{pmatrix} 3 \times 2 + 5 \\ 3 \times 7 - 2 \end{pmatrix}$ or answer $\begin{pmatrix} 11 \\ m \end{pmatrix}$ or answer $\begin{pmatrix} n \\ 19 \end{pmatrix}$ or $\begin{pmatrix} 6 \\ 21 \end{pmatrix}$ seen
	Additional Guidance		
	Condone fraction line for B2 or B1 eg $\begin{pmatrix} 11 \\ 19 \end{pmatrix}$		B2
	Answer $\begin{pmatrix} 11 \\ m \end{pmatrix}$ must have m as a numerical value		
	Answer $\begin{pmatrix} n \\ 19 \end{pmatrix}$ must have n as a numerical value		
	Must see the vector brackets to award any marks in the working eg $\frac{11}{19}$ or $\frac{11}{19}$ or $\frac{6+5}{21-2}$ or $\frac{6}{21}$		B0
	Unsimplified version may be awarded in the working but must be seen as a single vector eg $\begin{pmatrix} 6+5 \\ 21-2 \end{pmatrix}$		B1
	$\begin{pmatrix} 6 \\ 21 \end{pmatrix}$ may be awarded in the working if seen as a vector		B1

Question	Answer	Mark	Comments
15	Alternative method 1		
	20 – 0.5 or 19.5 or $r = \frac{w - 0.5}{1.5}$	M1	oe
	their 19.5 ÷ 1.5	M1dep	oe (20 – 0.5) ÷ 1.5 is M2
	13	A1	
	Alternative method 2		
	20 – their 11 from part (a) or 9	M1	implied by '6 extra cups (of rice)'
	7 + (their 9 ÷ 1.5) or 7 + 6	M1dep	
	13	A1	
	Additional Guidance		
	13 from incorrect working eg rounding 20 ÷ 1.5 = 13 eg scaling 11 and rounding ie 20 ÷ 11 × 7 = 13		M0M0A0
	Brackets omitted ie 20 – 0.5 ÷ 1.5, unless recovered		M0M0A0
	1.5 × 13 + 0.5 = 20, unless 13 selected		M1M1A0
	1.5 × 13 = 19.5, unless 13 selected		M1M1A0
	Trial and improvement, unless answer 13		M0M0A0

Question	Answer	Mark	Comments
16	Alternative method 1		
	$\frac{4}{3}\pi \times 30^3$ or $36\,000\pi$ or [112 757, 113 112] or $\frac{1}{2} \times \frac{4}{3}\pi \times 30^3$ or $18\,000\pi$ or [55 954, 56 839]	M1	oe allow 1.33... for $\frac{4}{3}$ allow 0.66... or 0.67 for $\frac{2}{3}$
	their [112 757, 113 112] $\div 4000$ or 9π or 28.(...) or their [55 954, 56 839] $\div 4000$ or $\frac{9\pi}{2}$ or [13.9, 14.21] or their [112 757, 113 112] $\div (4000 \times 60)$ or $\frac{3\pi}{20}$ or [0.46, 0.4713] or their [55 954, 56 839] $\div (4000 \times 60)$ or $\frac{3\pi}{40}$ or 0.23... or 0.24	M1dep	
	[13.9, 14.21] and Yes or 0.23... or 0.24 and Yes	A1	

Mark scheme and additional guidance continues on the next page

Question	Answer	Mark	Comments
16 cont	Alternative method 2		
	$\frac{4}{3}\pi \times 30^3$ or 36 000 π or [112 757, 113 112] or $\frac{1}{2} \times \frac{4}{3}\pi \times 30^3$ or 18 000 π or [55 954, 56 839]	M1	oe allow 1.33... for $\frac{4}{3}$ allow 0.66... or 0.67 for $\frac{2}{3}$
	4000 $\times$ 15 or 60 000	M1	
	[55 954, 56 839] and 60 000 and Yes	A1	
	Alternative method 3		
	$\frac{4}{3}\pi \times 30^3$ or 36 000 π or [112 757, 113 112] or $\frac{1}{2} \times \frac{4}{3}\pi \times 30^3$ or 18 000 π or [55 954, 56 839]	M1	oe allow 1.33... for $\frac{4}{3}$ allow 0.66... or 0.67 for $\frac{2}{3}$
	their [112 757, 113 112] $\div$ 15 or 2400 π or [7517, 7541] or their [55 954, 56 839] $\div$ 15 or 1200 π or [3730, 3790]	M1dep	
	[3730, 3790] and Yes	A1	
	Additional Guidance		
	Do not award A1 if incorrect conversion of $\frac{1}{4}$ hour seen		

Question	Answer	Mark	Comments
17	Alternative method 1		
	8^2 or 64 and 17^2 or 289	M1	
	$\sqrt{17^2 - 8^2}$ or $\sqrt{225}$ or 15	M1dep	oe implies M2 may be seen on diagram
	$8 \times 3 \times$ their 15 or $24 \times$ their 15	M1dep	dep on M2 oe eg $(8 + 16) \times$ their 15 or $0.5 \times 8 \times$ their 15×6
	360	A1	SC2 [448.8, 456]
	Alternative method 2		
	$\cos C = \frac{8}{17}$ or $C = [61.9, 62]$	M1	may be seen on diagram
	$17 \times \sin$ their $[61.9, 62]$ or $[14.9, 15.1]$	M1dep	may be seen on diagram oe eg $8 \times \tan$ their $[61.9, 62]$
	$8 \times 3 \times$ their $[14.9, 15.1]$ or $24 \times$ their $[14.9, 15.1]$ or $[357.6, 362.4]$	M1dep	dep on M2 oe eg $(8 + 16) \times$ their $[14.9, 15.1]$ or $0.5 \times 8 \times$ their $[14.9, 15.1] \times 6$
	360	A1	SC2 [448.8, 456]
	Alternative method 3		
	$\sin A = \frac{8}{17}$ or $A = [28, 28.1]$	M1	may be seen on diagram
	$17 \times \cos$ their $[28, 28.1]$ or $[14.9, 15.1]$	M1dep	may be seen on diagram oe eg $8 \div \tan$ their $[28, 28.1]$
	$8 \times 3 \times$ their $[14.9, 15.1]$ or $24 \times$ their $[14.9, 15.1]$ or $[357.6, 362.4]$	M1dep	dep on M2 oe eg $(8 + 16) \times$ their $[14.9, 15.1]$ or $0.5 \times 8 \times$ their $[14.9, 15.1] \times 6$
	360	A1	SC2 [448.8, 456]

Question	Answer	Mark	Comments
17 cont	Alternative method 4		
	$\cos C = \frac{8}{17}$ or $C = [61.9, 62]$	M1	may be seen on diagram
	$\frac{1}{2} \times 8 \times 17 \times \sin$ their $[61.9, 62]$ or $[59.9, 60.1]$	M1dep	oe
	$6 \times$ their $[59.9, 60.1]$ or $[357.6, 362.4]$	M1dep	oe
	360	A1	SC2 [448.8, 456]
	Additional Guidance		
	15 without a contradictory value for AB scores the first two marks on Alt method 1, even if not subsequently used	M1M1	
	$\sqrt{17^2 + 8^2}$	M1M0	
	3 rd M1 is for the total area and may be calculated in various ways eg using a trapezium + a triangle		
	3 rd M1 is for the total area so further work will lose the mark eg 360 seen followed by $360 - 60$, answer 300	M1M1M0A0	
	May use sine rule or cosine rule but must reach $AB = \dots$ to award the second M1 in Alt 2 or 3		