AQA

GCSE
MATHEMATICS
8300/2H

Higher Tier Paper 2 Calculator

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.

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. 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.

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.

Q	Answer	Mark	Comment
1	$\frac{1}{80}$	B1	

Q	Answer	Mark	Comment
2	P(A ∩ B')	B1	

Q	Answer	Mark	Comment
3	15	B1	

Q	Answer	Mark	Comment
4	$-5 < x \leqslant 1$	B1	

Q	Answer	Mark	Comments
5	**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

5 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

Q	Answer	Mark	Comments
6	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) × (prime number between 10 and 20) or 2125 ÷ (cube number > 1) or 2125 ÷ (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 ÷ 27 scores B1 with no evaluation or evaluated incorrectly eg3 2125 ÷ 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	

Q	Answer	Mark	Comments
7	**Alternative method 1** Words per minute or words per second		
	416 ÷ 8 or 52	M1	oe eg 416 ÷ (8 × 60) or 416 ÷ 480 or $\frac{13}{15}$ or [0.86, 0.87] or 0.9
	1534 ÷ their 52 or (1534 – 416) ÷ their 52 + 8 or 29.5	M1dep	oe eg 1534 ÷ their [0.86, 0.87] or (1534 – 416) ÷ their [0.86, 0.87] + 8 × 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 ÷ 416 or $\frac{1}{52}$ or [0.019, 0.019231] or 0.02	M1	oe eg 8 × 60 ÷ 416 or 480 ÷ 416 or $\frac{15}{13}$ or [1.15, 1.154] or 1.2
	1534 × their [0.019, 0.019231] or (1534 – 416) × their [0.019, 0.019231] + 8 or 29.5	M1dep	oe eg 1534 × their [1.15, 1.154] or (1534 – 416) × 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

7 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 × their [3.68, 3.69] or 8 × their [2.68, 2.69] + 8 or 29.5	M1dep	oe eg 8 × 60 × their [3.68, 3.69] or 8 × 60 × 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		

Q	Answer	Mark	Comments
8	**Alternative method 1**		
	90×5 or 450 or $\frac{72+83+88+97+x}{5}$ or $\frac{340+x}{5}$	M1	oe any letter or symbol
	$90 \times 5 - 72 - 83 - 88 - 97$ or $90 \times 5 - 340$ or $72 + 83 + 88 + 97 + x = 90 \times 5$ or $340 + x = 90 \times 5$	M1dep	oe any letter or symbol equations must have fraction eliminated
	110	A1	
	Alternative method 2		
	Trial of any value with mean correctly evaluated	M1	also allow if given to the next or previous integer eg1 trial of 100 $\frac{72+83+88+97+100}{5} = 88$ eg2 trial of 78 $\frac{340+78}{5} = 83$ (or 84 or 83.6) ignore trials with mean not evaluated or incorrectly evaluated
	Trial of 110 with mean evaluated to 90	M1dep	eg $\frac{72+83+88+97+110}{5} = 90$ this mark implies M1M1
	110	A1	

Mark scheme and Additional Guidance continue on the next page

8 cont	**Alternative method 3**		
	$\frac{72+83+88+97}{4}$ or $\frac{340}{4}$ or 85	M1	oe
	their 85 + 5 × (90 – their 85) or their 85 + 5 × 5 or their 85 + 25	M1dep	oe 90 + 4 × (90 – their 85)
	110	A1	
	Alternative method 4		
	$\frac{72+83+88+97}{5}$ or $\frac{340}{5}$ or 68	M1	oe
	5 × (90 – their 68) or 5 × 22	M1dep	oe
	110	A1	
	Alternative method 5		
	(90 – 72) + (90 – 83) + (90 – 88) + (90 – 97) or 18 + 7 + 2 – 7 or 20	M1	oe eg (72 – 90) + (83 – 90) + (88 – 90) + (97 – 90) or 90 × 4 – 72 – 83 – 88 – 97 or –18 – 7 – 2 + 7 or –20
	90 + their 20	M1dep	oe eg 90 – their –20
	110	A1	
	Additional Guidance		
	M1 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts		
	Embedded 110 scores M1M1A0 using Alt 2 (even if a different answer is given)		
	Condone eg Alt 3 72 + 83 + 88 + 97 ÷ 4 No further marks unless recovered		M1
	Alt 5 1st M1 Subtractions must be consistent		
	Condone 110% for 110		

Q	Answer	Mark	Comments
9(a)	$\frac{33}{120}$ or $\frac{11}{40}$ or 0.275 or 27.5%	B1	oe fraction, decimal or percentage
	Additional Guidance		
	Correct answer seen with an answer of 33		B0
	Ignore simplification or conversion if correct answer seen eg1 $\frac{33}{120}$ seen Answer $\frac{3}{10}$ eg2 0.275 seen Answer 0.28 eg3 $\frac{11}{40}$ seen Answer 27.5		 B1 B1 B1
	Ignore words if correct answer seen eg1 $\frac{33}{120}$ seen Answer 11 out of 40 eg2 $\frac{33}{120}$, unlikely		 B1 B1
	Answer given as ratio (even if correct answer also seen) eg 33 : 120		 B0
	Answer only in words eg 33 out of 120		B0
	Only 27.5 (without %)		B0
	Only 27% or 28%		B0
	Only 0.27 or 0.28		B0
	Only $\frac{1.1}{4}$		B0

Q	Answer	Mark	Comments
9(b)	$\frac{6}{120} \times 500$ or [4.16, 4.17] × 6 or [24.96, 25.02] or 4.2 × 6 or 25.2 or 25 : 500 or $\frac{25}{500}$	M1	oe eg 0.05 × 500 or 500 ÷ 20
	25	A1	
	Additional Guidance		
	Working and value may be seen by table		
	24 + 1, Answer 25		M1A1
	480 = 24, Answer 25		M1A1
	Embedded but not selected as answer eg 137.5 + 337.5 + 25 = 500		M1A0
	Working for Not answered or Answered but sale not made is **not** choice eg ignore 137.5 and 337.5 seen		
	25 followed by answer 19		M1A0
	If rounded or truncated values are used, the final answer must be exactly 25 eg1 500 ÷ 120 = 4.16, 4.16 × 6 Answer 25 (may have kept full value on calculator) eg2 500 ÷ 120 = 4.16, 4.16 × 6 = 24.96 Answer 25 (comes from further rounding)		 M1 A1 M1 A0

Q	Answer	Mark	Comments
10	80 × 0.9 or 72 or 25 × 1.2 or 30 or 80 × 0.1 **and** 25 × 0.2 or 8 **and** 5 or –8 **and** 5	M1	oe eg 80 × (1 – 0.1) or 25 + 25 × 0.2 or 25 + 5 implied by 102 or 3 or –3
	No and correct valid amount(s)	A1	eg no and 105 and 102 or no and 3 or no and –3 or no and 8 and 5 or no and –8 and 5
	Additional Guidance		
	If neither box is ticked, No may be implied eg neither box is ticked and Ellie paid 3 less		M1A1
	Working and values may be seen by the table		
	No and 105 with M1 not seen		M0A0
	No and 8 with M1 not seen		M0A0
	No and 5 with M1 not seen		M0A0
	Condone No and 8 and 5 with arithmetic error(s) seen eg 72 so 8 less 30 so 5 more 105 and 103 No (arithmetic error in calculating Ellie's total)		M1A1
	Do not condone No and 8 and 5 with process error(s) seen eg 80 – 8 = 72 25 – 5 = 20 (process error, should be 25 + 5) 105 and 92 No		M1A0

Q	Answer	Mark	Comments
11	**Alternative method 1**		
	16^2 or 256 and 30^2 or 900	M1	oe implied by 1156
	$\sqrt{16^2+30^2}$ or $\sqrt{256+900}$ or $\sqrt{1156}$ or 34	M1dep	oe eg $\sqrt{16^2+30^2-2\times16\times30\times\cos 90}$
	52 × their 34 or 1768	M1dep	oe if M1M0 their 34 can be any value other than 16, 30 or 52 dep on 1st M
	0.5 × 30 × 16 or 240	M1	oe eg 0.5 × 30 × 16 × sin 90
	2008	A1	SC3 2248
	Alternative method 2		
	$\tan^{-1}\frac{16}{30}$ or [28, 28.1] or $\tan^{-1}\frac{30}{16}$ or [61.9, 62]	M1	oe may be on diagram
	$\frac{30}{\cos(\text{their [28, 28.1]})}$ or $\frac{16}{\cos(\text{their [61.9, 62]})}$ or 34	M1dep	oe eg $\frac{16}{\sin(\text{their [28, 28.1]})}$ or $30\cos(\text{their [28, 28.1]}) + 16\cos(\text{their [61.9, 62]})$
	52 × their 34 or 1768	M1dep	oe if M1M0 their 34 can be any value other than 16, 30 or 52 dep on 1st M
	0.5 × 30 × 16 or 240	M1	oe eg 0.5 × 30 × 16 × sin 90
	2008	A1	SC3 2248

Additional Guidance is on the next page

11 cont	**Additional Guidance**	
	Up to M4 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts	
	The 4th mark in Alts 1 and 2 is not dependent on any other marks	
	34 or 1768 or 240 may be on the diagram	
	SC3 is for using 30 × 16 for the area of the triangle	
	Ignore units	

Q	Answer	Mark	Comments
12	y is 125% of x	B1	

Q	Answer	Mark	Comments
13(a)	$\frac{1}{3} \times \pi \times 24^2 \times 117$ or $\frac{2}{3} \times \pi \times 24^3$	M1	oe eg $\frac{1}{3}\pi \times 576 \times 117$ or $\frac{2}{3}\pi \times 13\,824$
	$22\,464\pi$ or [70 536, 70 582] or 9216π or [28 938, 28 957]	A1	may be seen in a sum implied by final A1
	$\frac{1}{3} \times \pi \times 24^2 \times 117 + \frac{2}{3} \times \pi \times 24^3$ or $22\,464\pi + 9216\pi$ or [70 536, 70 582] + [28 938, 28 957]	M1dep	oe
	$31\,680\pi$ or [99 474, 99 539]	A1	
	Additional Guidance		
	π may be seen as any value in the interval [3.14, 3.142]		
	Do not allow any misreads of formulae unless recovered eg $\pi \times 24^2 \times 117$ and $\frac{2}{3} \times \pi \times 24^2$		M0
	Allow dots for multiplication		
	For A marks allow eg $22\,464 \times \pi$ or $\pi \times 31\,680$		
	$31\,680\pi$ followed by incorrect evaluation attempt		M1A1M1A1
	$31\,680\pi$ followed by further work		M1A1M1A0
	31 680 only		M0A0M0A0
	$\frac{1}{3} \times \pi \times 24^2 \times 117 = 4725$ $\frac{2}{3} \times \pi \times 24^3 = 28\,952$ $4725 + 28\,952$ (even though 4725 is wrong the method for $\frac{1}{3} \times \pi \times 24^2 \times 117$ is seen)		M1A1 M1

Q	Answer	Mark	Comments
13(b)	**Alternative method 1** Uses volume scale factor		
	24 ÷ 2 or 12	M1	oe eg $12 \times 2 = 24$
	(their 12)^3	M1dep	oe eg $24^3 \div 2^3$ or $13\,824 \div 8$
	1728	A1	condone 1 : 1728 or 1728 : 1 SC2 $\frac{1}{1728}$
	Alternative method 2 Compares volumes of cornets (ie compares total volumes)		
	24 ÷ 2 or 12	M1	oe eg $12 \times 2 = 24$ may be implied eg (height of cone) 9.75 or (volume of cone) 13π or (volume of cone) [40.8, 40.85] or (total volume) $\frac{55}{3}\pi$ or [57.4, 57.7]
	their (a) ÷ $(\frac{1}{3}\pi \times 2^2 \times \frac{117}{\text{their } 12} + \frac{2}{3}\pi \times 2^3)$	M1dep	oe eg their (a) ÷ [57.4, 57.7]
	1728	A1	condone 1 : 1728 or 1728 : 1 SC2 $\frac{1}{1728}$

Mark scheme and Additional Guidance continue on the next two pages

13(b) cont	**Alternative method 3** Compares volumes of cones		
	24 ÷ 2 or 12	M1	oe eg 12 × 2 = 24 may be implied eg (height of cone) 9.75 or (volume of cone) 13π or (volume of cone) [40.8, 40.85] or (total volume) $\frac{55}{3}\pi$ or [57.4, 57.7]
	their volume of cone from (a) $\div (\frac{1}{3}\pi \times 2^2 \times \frac{117}{\text{their } 12})$	M1dep	oe eg their volume of cone from (a) ÷ [40.8, 40.85]
	1728	A1	condone 1 : 1728 or 1728 : 1 SC2 $\frac{1}{1728}$
	Alternative method 4 Compares volumes of hemispheres		
	their volume of hemisphere from (a) $\div (\frac{2}{3}\pi \times 2^3)$	M2	oe eg their volume of hemisphere from (a) ÷ [16.7, 16.8]
	1728	A1	condone 1 : 1728 or 1728 : 1 SC2 $\frac{1}{1728}$

Additional Guidance is on the next page

	Additional Guidance	
13(b) cont	π may be seen as any value in the interval [3.14, 3.142]	
	Answer $\times 1728$ or $1728\times$	M1M1A1
	Answer 12	M1M0A0
	Answer 12^3 with 1728 seen	M1M1A1
	Answer 12^3 without 1728 seen	M1M1A0
	Alts 2, 3 and 4 Allow if an incorrect volume formula from (a) is used in (b) eg Alt 4 (a) $\frac{1}{2} \times \frac{2}{3} \times \pi \times 24^3 = 4608\pi$ (b) $\frac{1}{2} \times \frac{2}{3} \times \pi \times 2^3 = \frac{8}{3}\pi$ $4608\pi \div \frac{8}{3}\pi$ 1728	M2 A1
	Alts 2 and 3 Allow $\frac{55}{3}$ rounded to 1dp or better eg allow 18.3	
	Alt 4 Allow $\frac{16}{3}$ rounded to 1dp or better eg allow 5.3	
	Alts 2 and 3 2nd M1 – allow consistent omission of π	
	Alt 4 M2 – allow consistent omission of π	
	Alts 2, 3 and 4 Answer 1728 is M1M1A1 unless it comes from rounding or truncating eg1 Alt 2 $99\,525.655 \div 57.595 = 1728$ eg2 Alt 2 $99\,525.655 \div 57.595 = 1728.03$ Answer 1728	M1M1A1 M1M1A0

Q	Answer	Mark	Comments
14(a)	**Alternative method 1**		
	375 + 400 + 1475 or 2250 or 13 seen or $\frac{59}{90}$ seen or [0.65, 0.66] seen	M1	oe for 375 allow 350 or 370 or 380 or 400 for 1475 allow 1450 or 1470 or 1480 or 1500 eg 400 + 400 + 1500 any estimated values must be seen eg only seeing 2300 is M0
	$\frac{1475}{375+400+1475} \times 29250$ or 1475 × 13 or [0.65, 0.66] × 29 250 or [19012.5, 19305]	M1dep	oe for 375 allow 350 or 370 or 380 or 400 for 1475 allow 1450 or 1470 or 1480 or 1500 for 29 250 allow 29 000 or 29 200 or 29 300 or 29 500 or 30 000
	19 175	A1	
	Alternative method 2		
	[234, 238]	M1	may be on the diagram
	$\frac{\text{their [234, 238]}}{360} \times 29250$ or their [234, 238] × 81.25	M1dep	oe for 29 250 allow 29 000 or 29 200 or 29 300 or 29 500 or 30 000
	19 175	A1	
	Additional Guidance		
	375 + 400 + 1475 = 2250 If they subsequently estimate 2250 no further marks can be scored		M1
	Answer 19 175 is M1M1A1 unless it comes from rounding or truncating eg1 Alt 1 0.65555 × 29 250 = 19 175 eg2 Alt 1 0.65555 × 29 250 = 19 174.8 Answer 19 175		M1M1A1 M1M1A0
	Alt 2 if their angle is outside the range [234, 238]		M0M0A0

Q	Answer	Mark	Comment
14(b)	It is lower than the answer to part (a)	B1	

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comment</th></tr>
<tr><td rowspan="8">15</td><td><table><tr><td>8</td><td>$\frac{1}{4}$</td><td>$\frac{1}{2}$</td></tr><tr><td>$\frac{1}{16}$</td><td>1</td><td>16</td></tr><tr><td>2</td><td>4</td><td>$\frac{1}{8}$</td></tr></table></td><td>B2</td><td>oe values eg 0.0625 for $\frac{1}{16}$
condone unprocessed values
eg for 8 allow $\frac{16}{2}$ or $\frac{8}{1}$
B1 at least three of the eight rows, columns and diagonals have a product of 1
do not count rows, columns or diagonals that only have ones
do not count incomplete rows, columns or diagonals</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">If decimal values are used they must be exact</td><td></td></tr>
<tr><td colspan="2">The given values in the grid cannot be changed</td><td></td></tr>
<tr><td colspan="2">B1 can be awarded with an incomplete grid eg
<table><tr><td>8</td><td>$\frac{1}{4}$</td><td></td></tr><tr><td>$\frac{1}{16}$</td><td>1</td><td></td></tr><tr><td>2</td><td>4</td><td>$\frac{1}{8}$</td></tr></table></td><td>B1</td></tr>
<tr><td colspan="2"><table><tr><td>1</td><td>$\frac{1}{4}$</td><td>1</td></tr><tr><td>1</td><td>1</td><td>$\frac{1}{2}$</td></tr><tr><td>1</td><td>4</td><td>$\frac{1}{8}$</td></tr></table>Three products of 1 but two are not counted as they only have ones</td><td>B0</td></tr>
</table>

Q	Answer	Mark	Comments
16(a)	Valid criticism of method indicating or implying that 30 is incorrect	B1	eg the shop was open for fewer than 30 days
	Additional Guidance		
	Valid criticism with non-contradictory statements		B1
	Contradictory statements		B0
	30 should be 26		B1
	The answer is 115 (allow 116 or 115.4 or 115.38…)		B1
	30 should be 25		B1
	The answer is 120		B1
	30 should be 24 (condone)		B1
	The answer is 125 (condone)		B1
	The answer is more than 100		B1
	The shop wasn't open for 30 days		B1
	He didn't work every day in June		B1
	The shop was shut on Sundays		B1
	He is open 6 days a week		B1
	The shop isn't open every day		B1
	He should divide by 31		B0
	He doesn't work weekends		B0
	There aren't 30 days in June		B0
	Not every month has 30 days		B0
	30 should be 27		B0
	The answer is less than 100		B0

Q	Answer	Mark	Comments
16(b)	**Alternative method 1**		
	3000 ÷ (9 + 4 + 7) or 3000 ÷ 20 or 150	M1	oe implied by 1350 or 600 or 1050 or 358.5(0) or 283.5(0)
	9 × 2.39 or 21.51 or 4 × 1.89 or 7.56 or 29.07	M1	oe may be embedded or implied eg 9 × 2.39 × their 150 or 4 × 1.89 × their 150 their 150 can be any number 3226.5(0) or 1134 or 4360.5(0) score M1M1
	(6660 – 9 × 2.39 × their 150 – 4 × 1.89 × their 150) ÷ (7 × their 150) or (6660 – 3226.5(0) – 1134) ÷ 1050 or (6660 – 4360.5(0)) ÷ 1050 or 2299.5(0) ÷ 1050	M1dep	oe eg (6660 – 9 × 2.39 × their 150 – 4 × 1.89 × their 150) ÷ (3000 – 9 × their 150 – 4 × their 150) or $\frac{219}{100}$ dep on M1M1 their 150 must be from 1st M1
	2.19	A1	

Mark scheme and Additional Guidance continue on the next page

16(b) cont	**Alternative method 2**		
	3000 ÷ (9 + 4 + 7) or 3000 ÷ 20 or 150	M1	oe implied by 1350 or 600 or 1050 or 358.5(0) or 283.5(0)
	9 × 2.39 or 21.51 or 4 × 1.89 or 7.56 or 29.07	M1	oe may be embedded or implied eg 9 × 2.39 × their 150 or 4 × 1.89 × their 150 their 150 can be any number 3226.5(0) or 1134 or 4360.5(0) score M1M1
	$\left(\frac{6660}{\text{their } 150} - 9 \times 2.39 - 4 \times 1.89\right) \div 7$ or (44.4(0) – 21.51 – 7.56) ÷ 7 or 15.33 ÷ 7	M1dep	oe eg (44.4(0) – 29.07) ÷ 7 or $\frac{219}{100}$ dep on M1M1 their 150 must be from 1st M1
	2.19	A1	
	Additional Guidance		
	Up to M1M1 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts		

Q	Answer	Mark	Comment
17	cylinder	B1	

Q	Answer	Mark	Comments
18	$\frac{-7 \pm \sqrt{7^2 - 4 \times 1 \times -11}}{2 \times 1}$ or $-\frac{7}{2} \pm \sqrt{\left(\frac{7}{2}\right)^2 + 11}$	M1	oe eg $\frac{-7 \pm \sqrt{49 + 44}}{2}$ or $\frac{-7 \pm \sqrt{93}}{2}$ or $-\frac{7}{2} \pm \sqrt{\frac{49}{4} + 11}$ or $-\frac{7}{2} \pm \sqrt{\frac{93}{4}}$
	1.3(2…) and –8.3(2…)	A1	
	Additional Guidance		
	$-3.5 \pm \sqrt{12.25 + 11}$ or $-3.5 \pm \sqrt{23.25}$		M1
	For M1 allow solutions given separately eg $\frac{-7 + \sqrt{93}}{2}$ and $\frac{-7 - \sqrt{93}}{2}$		M1
	Both solutions correct		M1A1
	One solution correct does not imply M1		
	Not using ± is M0 unless recovered eg1 $\frac{-7 + \sqrt{7^2 - 4 \times 1 \times -11}}{2 \times 1}$ followed by 1.32 eg2 $\frac{-7 + \sqrt{7^2 - 4 \times 1 \times -11}}{2 \times 1}$ followed by 1.3 and –8.3		M0A0 M1A1
	A short dividing line or a short square root symbol is M0 unless recovered eg by a correct solution		
	Condone if their square root symbol is above any part of –11		
	$\sqrt{(7^2 - 4 \times 1 \times -11)}$ is correct for $\sqrt{7^2 - 4 \times 1 \times -11}$		
	Both decimal solutions seen in working but only one on answer line		M1A0

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="9">19</td><td>(32, 8)</td><td>B3</td><td>B2 E (32, …) or E (…, 8)
B1 C (17, 18) or D (23, 14)
SC1 C (a, b) and D $(a + 6, b - 4)$</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Mark the answer line for B3 and B2 (if blank check working lines and diagram)</td><td></td></tr>
<tr><td colspan="2">B1 or SC1 is likely to be seen in working lines or on the diagram</td><td></td></tr>
<tr><td colspan="2">Condone missing brackets eg C 17, 18</td><td>B1</td></tr>
<tr><td colspan="2">Coordinates can be implied eg D $x = 23$ $y = 14$</td><td>B1</td></tr>
<tr><td colspan="2">Condone answers given as vectors for B2, B1 or SC1
eg $C\begin{pmatrix}17\\18\end{pmatrix}$</td><td>B1</td></tr>
<tr><td colspan="2">SC1 C cannot be (5, 26) or (11, 22) and coordinates of D must be evaluated
eg C (15, 17) and D (21, 13)</td><td>SC1</td></tr>
</table>

Q	Answer	Mark	Comments
20	**Alternative method 1**		
	5.88 ÷ 1.68 or 3.5 or 1.68 ÷ 5.88 or [0.285, 0.29] or 5.88 ÷ 5.60 or 1.05	M1	oe eg $\frac{7}{2}$ or $\frac{2}{7}$ or $\frac{21}{20}$ or 5.6 × 1.05 = 5.88
	5.6(0) ÷ (5.88 ÷ 1.68) or 5.6(0) × (1.68 ÷ 5.88) or 1.68 ÷ (5.88 ÷ 5.60) or 1.6	M1dep	oe eg 5.6(0) ÷ 3.5 or 5.6(0) × [0.285, 0.29] or 1.68 ÷ 1.05
	their 1.6 ÷ 1.68 or [0.952, 0.9524] or 1 – their 1.6 ÷ 1.68 or 1 – [0.952, 0.9524] or [0.0476, 0.048]	M1dep	oe eg $\frac{20}{21}$ or $1-\frac{20}{21}$ or $\frac{1}{21}$ 5.6(0) ÷ 5.88 oe scores M3 1 – 5.6(0) ÷ 5.88 oe scores M3
	4.76	A1	
	Alternative method 2		
	5.88 ÷ 5.6(0) or 1.05	M1	oe eg $\frac{21}{20}$
	1 ÷ their 1.05	M1dep	oe eg $1 \div \frac{21}{20}$
	[0.952, 0.9524] or 1 – [0.952, 0.9524] or [0.0476, 0.048]	M1dep	oe eg $\frac{20}{21}$ or $1-\frac{20}{21}$ or $\frac{1}{21}$ 5.6(0) ÷ 5.88 oe scores M3 1 – 5.6(0) ÷ 5.88 oe scores M3
	4.76	A1	

Additional Guidance is on the next page

	Additional Guidance	
20 cont	Up to M3 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts	
	$\frac{0.28}{5.60} = 0.05$ is M0 unless 1.05 subsequently used	
	$5.60 \div 1.68$ with no further correct working	M0
	Note that 1.6 seen may be from an incorrect method eg $1.68 \times 0.95 = 1.6$ does not score because 1.68×0.95 is an incorrect method and the actual value of 1.68×0.95 is 1.596	
	Any single calculation or set of calculations that lead to $\frac{20}{21}$ or $\frac{1}{21}$	M3
	Some common oes for $1 - 5.6(0) \div 5.88$ are $\frac{5.88 - 5.6(0)}{5.88}$ or $\frac{0.28}{5.88}$ and $\frac{1.68 - 1.6}{1.68}$ or $\frac{0.08}{1.68}$	M3
	3rd M1 oes include $[0.952, 0.9524] \times 100$ or $[95.2, 95.24]\%$ $100\% - [0.952, 0.9524] \times 100$ $[0.0476, 0.048] \times 100$ or $(4.76, 4.8]\%$	
	Values that score marks may be seen in ratios eg 5.88 : 1.68 (does not score at this stage) 3.50 : 1	M1
	Allow working in pence eg $588 \div 1.68$ or 350	M1
	Allow working in grams eg $5.88 \div 1680$ or 0.0035	M1

Q	Answer	Mark	Comment
21	$x^2 + y^2 = 6$	B1	

Q	Answer	Mark	Comment
22	8^{-5}	B1	

Q	Answer	Mark	Comments
23	$(3x + 2)(x - 6)$	B2	B1 $(3x + a)(x + b)$ where $ab = -12$ or $a + 3b = -16$ a and b must be integers SC1 $(-3x - 2)(6 - x)$
	Additional Guidance		
	Brackets in either order for B2 and B1 and SC1		
	$(3x + 6)(x - 2)$		B1
	$(3x + 4)(x - 3)$ or $(3x + 3)(x - 4)$ or $(3x - 3)(x + 4)$ or $(x + 3)(3x - 4)$		B1
	$(3x + 12)(x - 1)$ or $(x - 12)(3x + 1)$		B1
	Some B1 responses may be implied eg $3(x + 4)(x - 1)$ implies $(3x + 12)(x - 1)$		B1
	Do not allow answers involving fractions eg $3(x - 6)(x + \frac{2}{3})$		B0
	Some examples of B1 with $a + 3b = -16$ $(3x + 5)(x - 7)$ $(3x + 8)(x - 8)$ $(3x - 1)(x - 5)$ $(3x - 7)(x - 3)$		
	$(2 + 3x)$ is equivalent to $(3x + 2)$ etc		
	Condone use of multiplication signs in B2 or B1 responses eg $(3x + 2) \times (x - 6)$		B2
	Condone missing closing bracket in B2 or B1 responses eg $(3x + 6)(x - 2$		B1
	Ignore any attempt to 'solve' after B2 or B1 seen		

Q	Answer	Mark	Comments
24	$\frac{15-8}{6-2}$ or $\frac{7}{4}$	M1	oe eg $\frac{8-15}{2-6}$ or 1.75 may be embedded in an attempt at equation of line eg $y = \frac{7}{4}x\ldots$ may be implied
	$-1 \div$ their $\frac{7}{4}$ or $-\frac{4}{7}$ or $\frac{17-9}{x-0} \times$ their $\frac{7}{4} = -1$	M1	oe allow [–0.57143, –0.57] may be embedded in an attempt at equation of a line eg $y =$ their $-\frac{4}{7}x\ \ldots$
	$17 - 9 =$ their $-\frac{4}{7}x$ or $-4x = 56$ or $56 \div -4$	M1dep	oe equation must be of the form $ax = b$ (b can be unprocessed) dep on 2nd M1
	-14	A1	

Additional Guidance is on the next page

	Additional Guidance	
24 cont	The second mark is not dependent on the first – see examples below	
	(gradient of line through given points =) $\frac{6-2}{15-8}=\frac{4}{7}$ (gradient of perpendicular line =) $-\frac{7}{4}$ $17-9=-\frac{7}{4}x$	M0 M1 M1
	(gradient of line through given points =) $-\frac{7}{4}$ $\frac{17-9}{x}\times-\frac{7}{4}=-1$ $-56=-4x$	M0 M1 M1
	(gradient of line through given points =) $\frac{7}{4}$ (gradient of perpendicular line =) $\frac{4}{7}$	M1 M0M0
	Condone use of letters for gradients eg $x = 1.75$	M1
	For the first two marks, condone inclusion of x in their gradients	
	Answer -14 that comes from rounding or truncating cannot score A1 eg1 (perp grad =) –0.57 $8 = -0.57x$ Answer -14 eg2 (perp grad =) –0.57 $8 = -0.57x = -14.03$ Answer -14	M3A1 M3A0

Q	Answer	Mark	Comments
25	$x = 2y + 5$ or $x - 5 = 2y$ or $y - 5 = 2x$ or $\frac{y-5}{2}$	M1	oe eg $x = 2f^{-1} + 5$ or $f(x) - 5 = 2x$
	$\frac{x-5}{2}$	A1	oe eg $\frac{x}{2} - \frac{5}{2}$ may be implied eg by $12f^{-1}(x) = 6(x - 5)$ implied by $\frac{y-5}{2}$ if $\frac{x-5}{2}$ used in subsequent working
	Correctly expands $3(2x + 5) - 12 \times$ their $\frac{x-5}{2}$ to a linear expression	M1	$6x + 15 - 6x + 30$ if M1A1 their $\frac{x-5}{2}$ must be a function of x their $\frac{x-5}{2}$ cannot be $2x + 5$ implied by a correct linear expression or value for $3(2x + 5) - 12 \times$ their $\frac{x-5}{2}$
	$\frac{x-5}{2}$ and 45	A1	
	Additional Guidance		
	45 with no working		Zero
	45 from wrong working does not score 4 marks – mark the working seen		
	First A1 Condone $y = \frac{x-5}{2}$ or $f = \frac{x-5}{2}$ or $f(x) = \frac{x-5}{2}$ or $x = \frac{x-5}{2}$		
	For $6x + 15 - 6x + 30$ allow $\frac{12x+30-12x+60}{2}$ but not $6x + 15 - \frac{12x-60}{2}$		
	$x = 2y + 5$ $\frac{x+5}{2}$		M1A0
	$6x + 15 - \frac{12x}{2} - \frac{60}{2}$ (implied by –15)		M1A0
	$-2x - 5$		M0A0
	$6x + 15 + 24x + 60$ (implied by $30x + 75$)		M1A0

Q	Answer	Mark	Comments
26	18.9 ÷ 0.45 or 42	M1	oe
	their 42 ÷ 7 × 8 or 48	M1dep	oe eg $\frac{8}{7}$ × their 42 or [1.14, 1.143] × their 42
	0.45 ÷ 9 × 5 or 0.25	M1	oe eg $\frac{5}{9}$ × 0.45 or [0.55, 0.56] × 0.45 $\frac{8}{7} \times \frac{5}{9} \times 18.9$ oe scores M3
	12	A1	
	Additional Guidance		
	Up to M3 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts		
	Any single calculation or set of calculations that are a correct method and lead to 12		M3
	Note that the single calculation $\frac{8}{7} \times \frac{5}{9} \times 18.9$ does not use 0.45		M3
	An oe for $\frac{8}{7} \times \frac{5}{9} \times 18.9$ is $\frac{8}{7} \times \frac{18.9}{0.45} \times \frac{5}{9} \times 0.45$		M3
	Values may be seen in ratios eg 42 : 48		M1M1

Q	Answer	Mark	Comment
27	**Alternative method 1**		
	Sight of at least one of 2.35 or 2.45 or 2.85 or 2.95	M1	allow $2.44\dot{9}$ for 2.45 and $2.94\dot{9}$ for 2.95
	their 2.35 × their 2.85	M1	$2.3 \leqslant$ their 2.35 < 2.4 $2.8 \leqslant$ their 2.85 < 2.9
	2.35 × 2.85 selected and 6.6(975)	A1	accept 6.7(0) or 6.698 with 2.35 × 2.85 selected
	Alternative method 2		
	Sight of at least one of 2.35 or 2.45 or 2.85 or 2.95	M1	allow $2.44\dot{9}$ for 2.45 and $2.94\dot{9}$ for 2.95
	6.51 ÷ their 2.35 or 6.51 ÷ their 2.85	M1	$2.3 \leqslant$ their 2.35 < 2.4 $2.8 \leqslant$ their 2.85 < 2.9
	6.51 ÷ 2.35 and 2.7(7…) and 2.85 or 6.51 ÷ 2.85 and 2.2(8…) and 2.35	A1	
	Additional Guidance		
	Alt 1 2.35 × 2.85 amongst other calculations eg 2.45 × 2.95 and/or 2.35 × 2.95 can still score the second M1 but it must be clear that they are considering 2.35 × 2.85 = 6.6(975) to show that the bedroom can be rented eg1 2.35 × 2.85 = 6.6975 2.45 × 2.95 = 7.2275 eg2 2.35 × 2.85 = 6.6975 2.45 × 2.95 = 7.2275 2.35 × 2.95 = 6.9325 The lower bounds show it can be rented		M1M1A0 M1M1A1
	Ignore the calculation 2.4 × 2.9 throughout		
	Alt 1 6.6(975) or 6.7 or 6.698 without 2.35 × 2.85 selected		A0
	6.6975 only		M0M0A0
	Alt 2 2.7(7…) without 6.51 ÷ 2.35 and 2.85 seen		A0
	Alt 2 2.2(8…) without 6.51 ÷ 2.85 and 2.35 seen		A0

Q	Answer	Mark	Comments
28	interior angle = 150 or exterior angle = 30 or angle $BCN = 120$	B1	method not required may be seen on diagram
	interior angle = 150 with a valid method shown or exterior angle = 30 with a valid method shown or angle $BCN = 120$ with a valid method shown	B1dep	angles may be seen on diagram but methods will be in working lines eg $180 - \frac{360}{12} = 150$ or $\frac{1800}{12} = 150$ or $360 - 120 - 90 = 150$ or $\frac{360}{12} = 30$ or $\frac{180-120}{2} = 30$ or $180 - 150 = 30$ or $360 - 150 - 90 = 120$ or $360 - 240 = 120$ or $180 - 2 \times 30 = 120$
	interior angle = 150 with a valid method shown **and** exterior angle = 30 with a valid method shown **and** angle $BCN = 120$ with a valid method shown	B1dep	angles may be seen on diagram but methods will be in working lines eg $\frac{1800}{12} = 150$ **and** $\frac{180-120}{2} = 30$ **and** $360 - 240 = 120$ angles worked out in any order
	Fully correct working that must show correct progression and show all valid methods Valid methods shown must be appropriate for the approach used A reason must be included in the final step	B1dep	examples of the final step are (i) angle ABC + angle $CBN = 180$ (ii) interior angle = 150 in two different ways (iii) exterior angle = 30 in two different ways (iv) angle $BCN = 120$ in two different ways (v) sum of three angles at $C = 360$ (vi) sum of angles of triangle $BCN = 180$

Additional Guidance is on the next page

28 cont	**Additional Guidance**	
	Condone incorrect use of equals signs throughout eg interior angle = 12 – 2 = 10 × 180 = 1800 ÷ 12 = 150	B1B1
	interior angle may be seen as angle *ABC* or angle *BCD* exterior angle may be seen as angle *CBN*	
	It must be clear which angle they are working out eg1 Do not accept 150 if it is not correctly identified or not in the correct position on diagram eg2 Do accept 150 if it is identified as an interior angle or angle *ABC* or is in the correct position on the diagram	
	Do not accept incorrect statements eg1 exterior angle = 150 (even if 150 in correct position on the diagram) eg2 angle *ACB* = 150 (even if 150 in correct position on the diagram)	
	Ignore reasons for the first three marks	
	Angles on the diagram with no valid methods can score a maximum of B1B0B0B0	
	For the 2nd and 3rd marks the methods shown do not have to show progression	
	Example of fully correct working for (i) interior angle = $\frac{1800}{12} = 150$ angle *BCN* = 360 – 150 – 90 = 120 angle *CBN* = $\frac{180-120}{2} = 30$ 150 + 30 = 180 angles on a (straight) line	B1B1 B1 B1
	Example of fully correct working for (ii) exterior angle = $\frac{360}{12} = 30$ angle *BCN* = 180 – 2 × 30 = 120 interior angle = 360 – 120 – 90 = 150 interior angle = $\frac{1800}{12} = 150$ (interior) angle of polygon	B1B1 B1 B1

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="15">29</td><td>$(x-9)^2$…</td><td>M1</td><td>allow $\left(x-\frac{18}{2}\right)^2$ …
may be implied by a grid for $(x-9)^2$</td></tr>
<tr><td>$(x-9)^2-9^2+70$
or $(x-9)^2-81+70$
or $(x-9)^2-11$</td><td>M1dep</td><td>oe completing the square
eg $\left(x-\frac{18}{2}\right)^2-\left(\frac{18}{2}\right)^2+70$</td></tr>
<tr><td>(9, –11) with correct completing the square seen</td><td>A1</td><td>eg (9, –11) with $(x-9)^2-9^2+70$ seen
SC1 (9, –11) with correct completing the square not seen</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Allow $(x-9)^2$ to be $(9-x)^2$ throughout</td><td></td></tr>
<tr><td colspan="2">Allow $(x-9)^2$ to be $(x-9)(x-9)$ throughout</td><td></td></tr>
<tr><td colspan="2">Condone expression = 0 throughout</td><td></td></tr>
<tr><td colspan="2">$(x-9)^2=11$ with $(x-9)^2-11$ (= 0) also seen scores M1M1
Also scores A1 if answer correct</td><td></td></tr>
<tr><td colspan="2">$(x-9)^2=11$ without $(x-9)^2-11$ (= 0) also seen
Answer correct would still mean M1M0 (or SC1)</td><td>M1M0</td></tr>
<tr><td colspan="2">Allow as a slip if completing the square seen but the squared is omitted in a subsequent line
eg $(x-9)^2-81+70=(x-9)-11$
Answer (9, –11)</td><td>M1M1
A1</td></tr>
<tr><td colspan="2">$(x-9)-11$ and answer (9, –11)</td><td>SC1</td></tr>
<tr><td colspan="2">$(x-9)-11$ and answer not (9, –11)</td><td>M0M0A0</td></tr>
<tr><td colspan="2">(9, –11) with no method or from a different method eg calculus</td><td>SC1</td></tr>
<tr><td colspan="2"><table><tr><td></td><td>x</td><td>–9</td></tr><tr><td>x</td><td>x^2</td><td>$-9x$</td></tr><tr><td>–9</td><td>$-9x$</td><td>81</td></tr></table> Condone one of the products missing or incorrect</td><td>M1</td></tr>
</table>