GCSE
MATHEMATICS
8300/1F

Foundation Tier Paper 1 Non-Calculator

Mark scheme

November 2020

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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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	Comments
1	12	B1	

Q	Answer	Mark	Comments
2	50 000	B1	

Q	Answer	Mark	Comments
3	-7	B1	

Q	Answer	Mark	Comments
4	68 cm	B1	

Q	Answer	Mark	Comments
5	20 or 12 or 10 : 6	B1	oe ratio check diagram for area counting to 20 or 12
	5 : 3	B1ft	ft if B0 awarded, a correct and full simplification of any unsimplified ratio condone $\frac{5}{3}$: 1 or $1.\dot{6}$: 1 or 1 : $\frac{3}{5}$ or 1 : 0.6 SC1 3 : 5
	Additional Guidance		
	5 : 3 with no working		B2
	Ignore any units given with the answer		
	18 : 16 = 9 : 8 (perimeter)		B0B1ft
	Poor unit notation can score a maximum of B1 unless recovered 20^2 or 12^2 or $5^2 : 3^2$		B1B0

Q	Answer	Mark	Comments
6(a)	Dan and 20	B2	B1 150 or 2 min 10 or $2\frac{10}{60}$ or $2\frac{1}{6}$ or 20 in second gap
	Additional Guidance		
	If answer lines blank, up to 2 marks may be awarded from the working lines		
	Accept twenty for 20 Accept 2:10		
	Do not accept 130 for Dan		
	Condone 20 and Dan		B2
	Condone incorrect time notation if recovered eg 2.30 – 2.10 = 20, answer Dan and 20 s		B2
	Samir and 20		B1
	Dan alone does not score a mark eg Dan and 30 on answer line, with 150 in working eg Dan and 30 on answer line, no working eg Dan and 2 min 30 s is more		 B1 B0 B0
	2:50 – 1:30 = 20, answer of Dan and 20		B0
	130 = 2.1(0) Unless recovered……130 s = 2.10 min, answer of Dan and 20		B0 B2
	Accept any two conversions that enable comparisons eg 130 = 60 + 60 + 10 and 2.5 = 60 + 60 + 30		 B1
	2 min 10 with incorrect units eg 2 h 10 in working, answer Dan and 20 (recovered)		B1 B2

Q	Answer	Mark	Comments
6(b)	Wednesday and 3(.00) pm or Wednesday and 15.00 (h)	B2	B1 Wednesday or 3(.00) pm or 15.00 or 2 days 7 h or 48 + 7 or 24 + 24 + 7
	Additional Guidance		
	Allow 1500 or 15:00 for 15.00 Do not allow 15 or 15(00) pm for 15.00		
	Allow 3 (o'clock) in the afternoon for 3(.00) pm Do not allow 03.00 pm for 3(.00) pm		
	Do not ignore incorrect conversion of time eg 1300 = 3 pm		
	Mark intention eg W and 3 pm		B2
	Wed and 3 am or Wed and 3		B1
	55 – 7 = 48		B1

Q	Answer	Mark	Comments
7	344	B1	
	39	B1	
	305	B1ft	ft their 344 – their 39 if either B1B0 or B0B1 awarded
	Additional Guidance		
	If their division results in a decimal answer, allow correct rounding to 0dp or better for the B1ft eg 234 ÷ 6 = 38.333, 344 – 38.3 = 305.7 (may have answer 306) eg 344, 234 ÷ 6 = 20.3, answer 324		B1B0B1ft B1B0B1ft
	Negative, fractional and decimal answers are acceptable on ft		

Q	Answer	Mark	Comments
8(a)	160	B1	
	Additional Guidance		
	If answer line blank, check diagram		
	Accept 160 people but not adults or students		
	Accept 160 out of 540		B1
	Do not accept $\frac{160}{540}$		B0

Q	Answer	Mark	Comments
8(b)	(difference =) 6 – 3.5 or 2.5 or (working in small boxes) 24 – 14 or (S) 6 × 40 or 24 × 10 or 240 or (A) 3.5 × 40 or 14 × 10 or 140 or 40 + 40 + 20	M1	oe
	100	A1	
	Additional Guidance		
	Check diagram for working		

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="4">8(c)</td><td>Valid criticism</td><td>B1</td><td>eg the scale on the vertical axis is incorrect
eg 2500 is missing</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Middle bar should be taller / is too short
Students bar is wrong
Number of people hasn’t been plotted correctly

3000 should be 2500
They missed out (or didn’t label) 2500
3000 is wrong
3000 is too big a gap (implies 1000 people instead of 500)
3000 is too small a gap (implies 500 space for 1000)
Arrow/circle on diagram showing the jump from 2000 to 3000 but no words
From 2000 to 3000 it went up in 200 (refers to little squares)
3000 should be at the top/end (of the grid)

Changes scale
Scale is wrong
Numbers on the side are incorrect
Lacks consistency on the way up
Number of people does not go up in equal amounts
Uneven/unequal number of people
Should go up in 500s
It goes up by 1000
Was going up by 500 then went up by 1000
Starts going up in hundreds then goes up in 200s</td><td>B1</td></tr>
<tr><td colspan="2">The gap is too big
Space between bars
Spaces too big between numbers
Numbers on the y axis are not in order (they are numerically in order)
There is a gap/space on the (vertical) axis
Should go up in even numbers (they are going up in even numbers)
Starts (going up) in hundreds then goes up in thousands</td><td>B0</td></tr>
</table>

Q	Answer	Mark	Comments
9	**Alternative method 1**		
	(12 – 8) × 1200 or 4 × 1200 or 4800	M1	oe
	12 500 – 7600 or 4900	M1	oe
	4800 and 4900 and No	A1	
	Alternative method 2		
	(12 – 8) × 1200 or 4 × 1200 or 4800	M1	oe
	12 500 – their 4800 or 7700	M1dep	oe
	7700 and No	A1	
	Alternative method 3		
	(12 – 8) × 1200 or 4 × 1200 or 4800	M1	oe
	7600 + their 4800 or 12 400	M1dep	oe
	12 400 and No	A1	
	Alternative method 4		
	12 500 – 7600 or 4900	M1	oe
	their 4900 ÷ (12 – 8) or 1225	M1dep	oe
	1225 and No	A1	

Mark scheme and additional guidance for this question are continued on the next page

9 cont	**Alternative method 5**			
	12 500 – 7600 or 4900	M1	oe	
	their 4900 ÷ 1200 or 4.1 (or better)	M1dep	oe accept any indication of "more than 4" for 4.1	
	4.1 (or better) and (12 – 8 =) 4 and No	A1	their 4 must be months remaining and not 4.1 rounded	
	Additional Guidance			
	4 × 1200 = 4800, 7600 + 4800 = 12 600 and Yes Alt3			M1M1depA0
	12 – 8 = 3, 3 × 1200 = 3600, 3600 + 7600 = 11 200 and No Alt3			M1M1depA0
	3 × 1200 = 3600, 12 500 – 3600 = 8900 and No			M0M0depA0
	12 500 – 7600 = 4900, 4900 ÷ 1200 = 4.1 = 4 and No (4 comes from rounding, not the number of months remaining)			M1M1A0
	Further calculations that say how much more he'd need to earn (annually or monthly) must be correct (if given) to score the A1			

Q	Answer	Mark	Comments
10	3	B1	

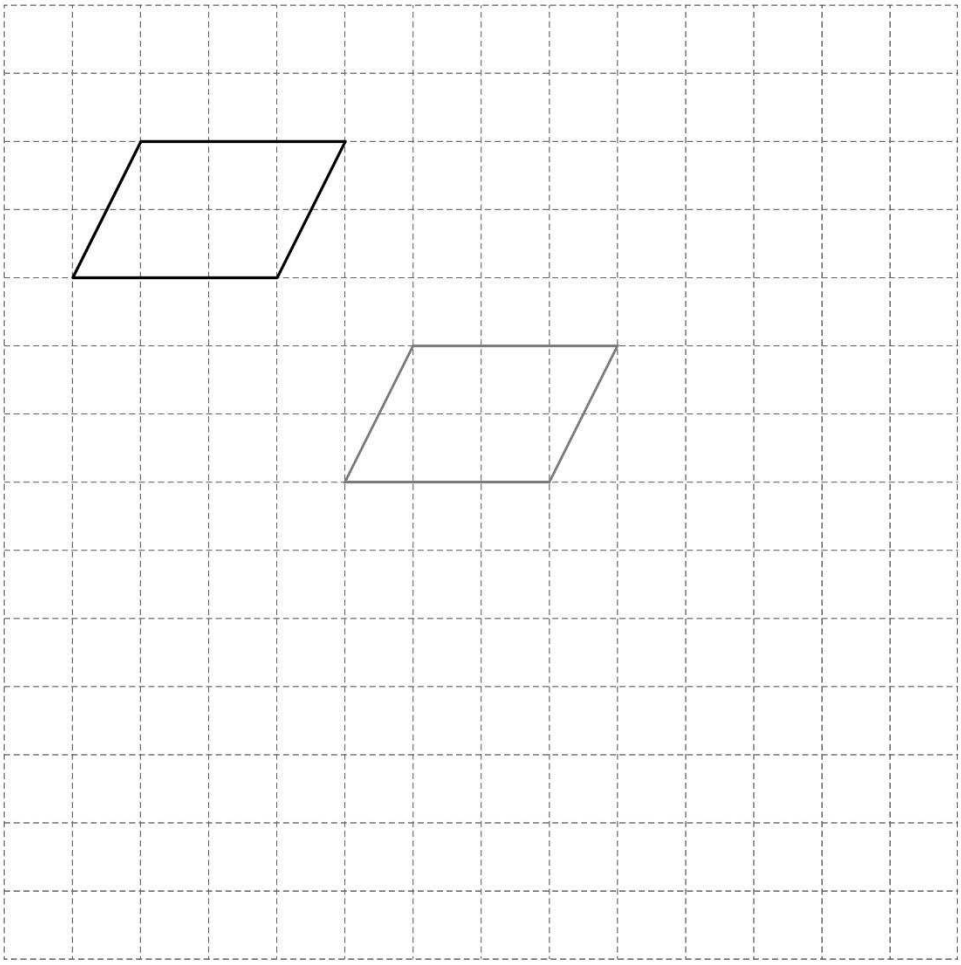
Q	Answer	Mark	Comments
11(a)	10	B1	

Q	Answer	Mark	Comments	
11(b)	0.73	B2	B1 0.7(…) or digits 73 seen	
	Additional Guidance			
	Condone .73			B2
	Condone .7(…)			B1
	0.7.3			B1

Q	Answer	Mark	Comments
12(a)	29	B1	
	Additional Guidance		
	Accept 29 out of 50 Do not accept $\frac{29}{50}$ or 29 : 50		

Q	Answer	Mark	Comments
12(b)	4	B1	
	Additional Guidance		
	Accept 4 out of 50 Do not accept $\frac{4}{50}$ or 4 : 50		

Q	Answer	Mark	Comments
12(c)	$\frac{17}{50}$ or 0.34 or 34%	B1	oe fraction
	Additional Guidance		
	Ignore attempts to simplify or convert a correct fraction		
	Ignore probability words		
	17 out of 50 or 17 in 50 or 17 : 50 is B0 however, condone 17 out of 50 or 17 in 50 with a correct fraction, decimal or percentage (together on answer line)		B1
	but do not accept 17 : 50 with a correct fraction, decimal or percentage (together on answer line)		B0

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="5">13</td><td>Parallelogram in correct position</td><td>B2</td><td>B1 answer 4 squares left
or
answer 3 squares up
or
answer 4 squares right & 3 squares down</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">  </td><td>B2</td></tr>
<tr><td colspan="2">Mark intention of straight lines
Mark intention for position of vertices</td><td></td></tr>
<tr><td colspan="2">Answer not congruent to original shape</td><td>B0</td></tr>
</table>

Q	Answer	Mark	Comments
14(a)	$6x = 13 + 11$ or $6x = 24$ or $\frac{24}{6}$	M1	oe eg $-6x = -13 - 11$ or $-6x = -24$ or $\frac{-24}{-6}$
	4	A1	
	Additional Guidance		
	Embedded answer, eg $6 \times 4 - 11 = 13$		M1A0
	24 with no other working		M0A0
	Flow chart method, if 4 not given as the answer. $x \rightarrow \times 6 \rightarrow -11 \rightarrow 13$ and $13 \rightarrow +11 \rightarrow \div 6 \rightarrow x$		M1A0

Q	Answer	Mark	Comments
14(b)	$(2 \times 4a =)\ 8a$	B1	
	$\left(\frac{15a}{3} =\right)\ 5a$	B1	
	$13a + 2$	B1ft	ft B1B0 or B0B1 for their $8a$ + their $5a + 9 - 7$ is in the form $pa + q$ do not award with further incorrect work eg $13a + 2 = 15a$
	Additional Guidance		
	$13a + c$ could come from incorrect working eg $8a + 4 + 9 + 5a - 7 = 13a + 16$ (their $8a$ is $8a + 4$) eg $8a + 4 + 9 + 5a - 7 = 13a + 6$ (their $8a$ is $8a + 4$) eg $8a + 9 + 5a - 7 = 13a + 16$ eg $13a + 16$ (no other working)		B0B1B0ft B0B1B1ft B1B1B0ft B1B1B0ft
	$6a + 9 + 5a - 7 = 11a + 2$		B0B1B1ft
	$8a + 9 + 12a - 7 = 20a + 2$		B1B0B1ft
	$8a + 9 + 5 - 7 = 8a + 7$		B1B0B1ft
	$8a + \frac{15a}{3} + 7$		B1B0B0ft
	$6a + 9 + 12a - 7 = 18a + 2$		B0B0B0ft
	$6a + 5a + 16 = 11a + 16$		B0B1B0ft

Q	Answer	Mark	Comments
15	**Alternative method 1**		
	4×10 or 40	M1	
	$68 - 4 \times 10$ or $68 - 40$ or 28	M1dep	oe
	their $28 \div 4$ or 7	M1dep	oe
	49	A1	
	Alternative method 2		
	$68 \div 4$	M1	
	17	A1	
	their $17 - 10$ or 7	M1dep	dep on M1
	49	A1	
	Additional Guidance		
	Check for working on diagram		

Q	Answer	Mark	Comments
16(a)	$\frac{11}{36}$	B2	B1 $\frac{22}{72}$ or 11 out of 36 or correctly simplified proper fraction that originally had a denominator >13
	Additional Guidance		
	Condone 11 out of 36 with $\frac{11}{36}$ (together on the answer line)		B2
	$\frac{11}{36}$ in working and 11 out of 36 on answer line		B1
	$\frac{22}{150} = \frac{11}{75}$		B1
	$\frac{2}{4} = \frac{1}{2}$		B0
	22 out of 72 with no other working		B0
	22 out of 72 with $\frac{22}{72}$		B1
	11 : 36		B0

Q	Answer	Mark	Comments
16(b)	$\frac{41}{78}$	B1	oe fraction, decimal or percentage
	Additional Guidance		
	Ignore attempts to simplify or convert a correct fraction		
	Ignore probability words		
	Decimals or percentages to 2sf or better		
	41 out of 78 or 41 in 78 or 41 : 78 is B0 however, condone 41 out of 78 or 41 in 78 with a correct fraction, decimal or percentage (together on answer line) but do not accept 41 : 78 with a correct fraction, decimal or percentage (together on answer line)		B1 B0

Q	Answer	Mark	Comments
16(c)	$\frac{17+13}{150}$ or $\frac{30}{150}$ or 30 ÷ 150 or 0.2	M1	oe
	20	A1	SC1 for 80 (not car) or 49 or better (Bus) or 31 or better (Walk)
	Additional Guidance		
	Build up method: 150 = 100%, 15 = 10%, 30 = 20%, answer 20% 150 = 100%, 15 = 10%, 15 × 2 = 10% × 2, 30 = 25%, answer 25% 150 = 100%, 15 = 10%, 30 = 15%, answer 15%		M1A1 M1A0 M0A0
	$\frac{30}{150}$ seen, then 30% of 150 attempted		M1A0
	30 out of 150 or 30 : 150 with no other working		M0A0

Q	Answer	Mark	Comments
17	$y = 3x$	B1	

Q	Answer	Mark	Comments
18(a)	$\frac{110}{100} \times 80$ or (10% =) 8	M1	oe eg $80 + \frac{1}{10} \times 80$ or $80 + 8$ or 8×11 or 110×0.8 or 1.1×80 or 72 (implies 8)
	88	A1	
	Additional Guidance		
	88% as answer		M1A0

Q	Answer	Mark	Comments
18(b)	$\frac{7}{4}$	B1	

Q	Answer	Mark	Comments
19(a)	$\frac{2}{5}$ or $\frac{30}{5}$ or (30 ÷ 5 =) 6 or 5×6	M1	oe fraction, decimal or percentage implied by $2 \times \frac{30}{5}$ or 2×6
	12	A1	SC1 18
	Additional Guidance		
	Accept a fully correct ratio build up method: eg 2 : 5, 4 : 10, 6 : 15, 8 : 20, 10 : 25, 12 : 30 with nothing on answer line eg 2 : 3, 4 : 6, 6 : 9, 8 : 12, 10 : 15, 12 : 18 with nothing on answer line		 M1A0 M1A0
	30 ÷ 5 = 6 and 30 ÷ 3 = 10 and 30 ÷ 2 = 15 (choice)		M0A0
	6 must not come from 2 × 3		

Q	Answer	Mark	Comments
19(b)	$30 + 3$ or $35 - 2$ or 33 or $(1 -) \frac{2}{35}$	M1	oe
	$\frac{33}{35}$	A1	oe fraction, decimal or percentage
	Additional Guidance		
	Ignore attempts to simplify or convert a correct fraction		
	Ignore probability words		
	Decimals or percentages to 2sf or better		
	Condone 33 out of 35 or 33 in 35 with a correct fraction, decimal or percentage (together on answer line) but do not accept 33 : 35 with a correct fraction, decimal or percentage (together on answer line)		M1A1 M1A0

Q	Answer	Mark	Comments
20	Graph A Strong negative	B1	
	Graph B No correlation	B1	allow 'No' or 'None'
	Additional Guidance		
	Condone incorrect spelling if intention is clear		
	Allow clear link(s) from the table to the answer line eg an arrow from 'Strong negative' to the Graph A answer line		

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="11">21(a)</td><td>First term 2
and
Third term 8</td><td>B2</td><td>B1 one correct
or First term 2^1
or Third term 2^3
or First term -2 and Third term -8
or $4x^2 = 16$ (any letter) oe equation
or $ar = 4$ and $ar^3 = 16$</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">If answer lines are blank, mark progression first and then working lines</td><td></td></tr>
<tr><td colspan="2">Correct answer for 1st term or 3rd term in the progression, but incorrect numerical term on answer line</td><td>B0 for that term</td></tr>
<tr><td colspan="2">Correct answer for 1st term or 3rd term in the progression, with non-contradictory algebraic term on answer line</td><td>B1 for that term</td></tr>
<tr><td colspan="2">Correct answers for 1st term and 3rd term in the progression, with non-contradictory algebraic terms on answer lines</td><td>B2</td></tr>
<tr><td colspan="2">First term 2
Third term 2^3</td><td>B1</td></tr>
<tr><td colspan="2">First term -2
Third term 10</td><td>B0</td></tr>
<tr><td colspan="2">$4x = \frac{16}{x}$ (any letter)</td><td>B1</td></tr>
</table>

Q	Answer	Mark	Comments	
21(b)	**Alternative method 1**			
	3rd term = 9p	M1	oe implied by a total of 15p	
	p + 5p + their 3rd term = 90 or 15p = 90	M1	oe their 3rd term must be a linear expression in terms of p 90 ÷ 15 implies M1M1	
	6	A1ft	ft their 3rd term, which must be a linear expression in p, or their equation in the form sum of 3 linear terms in p = 90 allow ft answers rounded to 1dp or better	
	Alternative method 2			
	90 ÷ 3 or 30	M1	oe	
	5p = their 30	M1dep	oe	
	6	A1		
	Additional Guidance			
	For A1ft, if not an integer, the answer must be given as a decimal, fully simplified fraction or fully simplified mixed number Once awarded, ignore further incorrect conversions eg p + 5p + 25p = 90, 31p = 90, p = $\frac{90}{31}$, p = 3 (ignore conversion)			M0M1A1ft
	Their 3rd term may first appear in their addition, eg p + 5p + 10p = 90 implies that 10p is their 3rd term			M0M1
	(3rd term 5p + 4), p + 5p + 5p + 4 = 90, p = 7.8			M0M1A1ft
	(3rd term 10p), p + 5p + 10p = 90, p = 5.625			M0M1A1ft
	Sum 15p and/or answer 6 may come from incorrect 3rd term, eg eg1 (3rd term 10p), p + 5p + 10p = 15p, (15p = 90), p = 6 receives 2nd mark only; they have an incorrect 3rd term and an incorrect total for their 3 terms, but their answer is correct for their total, so equating to 90 is implied even if not seen eg2 (3rd term 10p), p, 5p, 10p, 15p = 90, p = 6			M0M1A0ft M0M0A0ft
	If their 3rd term has an algebraic coefficient the 2nd mark can be awarded for a correct equation, but A1 cannot be awarded eg (3rd term np), p + 5p + np = 90			M0M1A0

Q	Answer	Mark	Comments
22	2160	B1	may be implied by 240 or 10 800
	$\frac{5 \times \text{their } 2160}{9}$ or 5×240 or $10\,800 \div 9$ or 1200	M1	oe
	1473	A1	
	Additional Guidance		
	Accept 0.55 or 0.56 or better for $\frac{5}{9}$		
	eg $\frac{5}{9}(2160) + 273$ (no indication that they know to multiply by $\frac{5}{9}$)		B1M0A0
	eg $\frac{5}{9} \times (2160) + 273$		B1M1A0
	eg 2130, $5 \times 2130 \div 9$		B0M1A0

Q	Answer	Mark	Comments
23	**Alternative method 1**		
	0.275 × 3 or 0.825 or 0.275 ÷ 10 or 0.0275	M1	oe
	0.0825	A1	
	Alternative method 2		
	0.08… from division of 33 by 400 or 0.08… from division of 3.3 by 40	M1	
	0.0825	A1	
	Alternative method 3		
	$33 \times \frac{1000}{400}$ or 33 × 2.5 or 33 ÷ 4 or 0.33 ÷ 4 or digits 825	M1	oe
	0.0825	A1	

Q	Answer	Mark	Comments
24	**Alternative method 1**		
	2400 ÷ (3 + 5) or 2400 ÷ 8 or 300	M1	oe accept $\frac{1}{8}$ of 2400
	5 × their 300 or 1500 or 3 × their 300 or 900 or their 300 ÷ 6 or 50	M1dep	oe
	5 × their 300 ÷ 6 or (2400 – 3 × their 300) ÷ 6 or 1500 ÷ 6	M1dep	oe
	250	A1	
	Alternative method 2		
	2400 ÷ 6 or 400	M1	oe
	their 400 ÷ (3 + 5) or 50	M1dep	oe 2400 ÷ 48 scores M1M1
	5 × their 50 or 400 – (3 × their 50)	M1dep	oe
	250	A1	
	Additional Guidance		
	Answer 400 with 1500 or 900 in working		M1M1M0A0
	Answer 400 with 250 in working		M1M1M1A0
	Condone incorrect representation of a division if recovered eg 8 ÷ 2400 = 300		M1

Q	Answer	Mark	Comments
25	$2x(x + 3)$	B2	B1 $x(2x + 6)$ or $2(x^2 + 3x)$
	Additional Guidance		
	Condone missing final bracket $2x(x + 3$ Condone $(2x + 0)(x + 3)$		B2 B2
	Condone multiplication signs for B1 but not B2 Condone $1x$ for x for B1 but not B2 Condone incorrect algebraic notation for B1 but not B2 eg $x(x2 + 6)$		
	Do not allow further work for B2 but ignore further work for B1 eg $2x(x + 3) = 2x(3x)$ eg $x(2x + 6) = x(8x)$		B1 B1

Q	Answer	Mark	Comments
26(a)	$21 \div 7 \times 2$ (= 6) or $21 \div 3 = 7$ and $6 \div 3 = 2$ or $21 \div 7 = 3$ and $6 \div 2 = 3$ or $7 \times 3 = 21$ and $2 \times 3 = 6$	B1	oe eg $6 \div 2 = 3$ and $7 \times 3 = 21$
	Additional Guidance		
	3×2 (= 6)		B0
	7 : 2 (=) 21 : 6 with no other working		B0
	7 : 2 (=) 21 : 6 with multiplication by 3 shown by arrow(s)		B1
	7 : 2 (=) 14 : 4 (=) 21 : 6		B1
	Do not condone incorrect representation of a division eg $7 \div 21 = 3$		B0
	Do not condone incorrect mathematical representation eg $21 \div 7 = 3 \times 2 = 6$		B0
	$21 \div 6 = 3.5$, $3.5 \times 2 = 7$		B1
	$21 \times 2 = 42$, $42 \div 7 = 6$		B1

Q	Answer	Mark	Comments
26(b)	**Alternative method 1**		
	$2 \times \pi \times 21$ or $\pi \times 42$ or 42π or [131.88, 132]	M1	oe condone [3.14, 3.142] for π
	$2 \times \pi \times 6 \div 4$ or $\pi \times 12 \div 4$ or 3π or [9.4, 9.43]	M1	oe arc length of quarter circle condone [3.14, 3.142] for π
	$2 \times \pi \times 6 \div 4 + 2 \times 6$ or $3\pi + 12$ or [21.4, 21.43]	M1dep	oe dep on 2nd M1 this does not imply M1M1M1
	$45\pi + 12$	A1	
	Alternative method 2		
	$2 \times \pi \times 21$ or $\pi \times 42$ or 42π or [131.88, 132]	M1	oe condone [3.14, 3.142] for π
	$2 \times \pi \times 21$ and $2 \times \pi \times 6 \div 4$ or 42π and 3π or $2 \times \pi \times 21 + 2 \times 6$ or $42\pi + 12$ or [143.88, 144]	M1dep	oe eg 42π and [9.4, 9.43] or [131.88, 132] and 3π
	$2 \times \pi \times 21 + 2 \times \pi \times 6 \div 4$ or $42\pi + 3\pi$ or 45π or [141, 141.43] or [153, 153.43]	M1dep	oe eg 42π + [9.4, 9.43] or [131.88, 132] + 3π
	$45\pi + 12$	A1	

Additional guidance for this question is on the next page

26(b) cont	**Additional Guidance**	
	Condone $3(15\pi + 4)$	M1M1M1A1
	Condone, for example, $\pi 42$ for up to M1M1M1	
	$21\pi + 3\pi + 12$	M0M1M1A0 on alt 1
	$441\pi + 3\pi + 12$	M0M1M1A0 on alt 1
	$42\pi + 36\pi + 12$	M1M1M0A0 on alt 2
	$441\pi + 36\pi + 12$	M0M0M0A0
	Using πr^2 instead of $2\pi r$ throughout	M0M0M0A0
	$45\pi + 12$ in working with incorrect further work, eg $45\pi + 12 = 57\pi$	M1M1M1A0

Q	Answer	Mark	Comments
27	**Alternative method 1**		
	cos and $\frac{9}{18}$ oe identified	M1	
	60	A1	
	Alternative method 2		
	sin and $\frac{\sqrt{18^2 - 9^2}}{18}$ identified or tan and $\frac{\sqrt{18^2 - 9^2}}{9}$ identified	M1	
	60	A1	
	Additional Guidance		
	Accept an embedded answer, eg cos 60 = $\frac{9}{18}$ with no further working		M1A1
	$180 \div 3 = 60$		M0A0

Q	Answer	Mark	Comments
28	**Alternative method 1**		
	$3c = d + 2$ or $3c - 2$	M1	
	$d = 3c - 2$ or $d = -2 + 3c$ or $3c - 2 = d$ or $-2 + 3c = d$	A1	
	Alternative method 2		
	$c - \frac{2}{3} = \frac{d}{3}$ or $3\left(c - \frac{2}{3}\right)$	M1	
	$d = 3\left(c - \frac{2}{3}\right)$	A1	
	Additional Guidance		
	Flow chart method, with incorrect final answer: $d \rightarrow +2 \rightarrow \div 3 \rightarrow c$ and $c \rightarrow \times 3 \rightarrow -2 \rightarrow d$		M1A0
	Condone × signs for M1 but not A1 Condone c3 for M1 but not A1		

Q	Answer	Mark	Comments
29(a)	3.6×10^5	B1	
	Additional Guidance		
	Do not ignore further work		
	Ignore leading/trailing zeros eg 3.60000×10^5		B1
	Condone $10^5 \times 3.6$		B1
	$3.6 + 10^5$		B0

Q	Answer	Mark	Comments
29(b)	0.0092	B1	
	Additional Guidance		
	Do not ignore further work		
	Ignore additional zeros before the decimal point or after the 2		
	Accept .0092		B1
	0.009.2		B0