GCSE
MATHEMATICS
8300/3F

Foundation Tier Paper 3 Calculator

Mark scheme

June 2019

Version: 1.0 Final

196G83003F/MS

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

Copyright © 2019 AQA and its licensors. All rights reserved.
AQA retains the copyright on all its publications. However, registered schools/colleges for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to schools/colleges to photocopy any material that is acknowledged to a third party even for internal use within the centre.

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 $a \leq$ 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	20	B1	
2	$x = 13$	B1	
3	$\frac{9}{4}$	B1	
4	$\frac{x}{y}$	B1	

Question	Answer	Mark	Comments
5	Correct conversion to a comparable form $(\frac{31}{40} =)$ 0.775 or $(\frac{3}{4} =) \frac{30}{40}$ or 0.75 or $(\frac{7}{10} =) \frac{28}{40}$ or 0.7 or $(0.725 =) \frac{29}{40}$ or any two of 77.5(%), 75(%), 70(%), 72.5(%)	M1	
	$\frac{7}{10}$ 0.725 $\frac{3}{4}$ $\frac{31}{40}$ with no incorrect working	A1	oe accept in converted form
	Additional Guidance		
	Two correct conversions using fractions with common denominators other than 40 eg $\frac{124}{160}$ and $\frac{120}{160}$	M1	
	Correct order with incorrect working $\frac{31}{40} = 0.925$, $\frac{3}{4} = 0.75$, $\frac{7}{10} = 0.7$ $\frac{7}{10}$, 0.725, $\frac{3}{4}$, $\frac{31}{40}$	M1A0	

Question	Answer	Mark	Comments
6(a)	**Alternative method 1**		
	8.8(0) ÷ 11 or (0).8(0) or 880 ÷ 11 or 80	M1	oe 8.8(0) × 14 or 123.2(0) or 880 × 14 or 12320
	their (0).8(0) × 3 (+ 8.8(0)) or 2.4(0) (+ 8.8(0)) or their 80 × 3 (+ 880) or 240 (+ 880) or their (0).8(0) × 14 or their 80 × 14 or 11.2 or 1120	M1dep	oe their 123.2(0) ÷ 11 or their 12320 ÷ 11
	11.20	A1	Condone (£)11.20p
	Alternative method 2		
	11 ÷ 8.8(0) or 1.25 or 11 ÷ 880 or 0.0125	M1	oe
	14 ÷ their 1.25 or 14 ÷ their 0.0125 or 11.2 or 1120	M1dep	oe
	11.20	A1	Condone (£)11.20p
	Additional Guidance		
	8.8(0) × $\frac{14}{11}$ or 8.8(0) × 1.27(…)		M1M1
	$\frac{56}{5}$ is oe for 11.2		M1M1
	$\frac{4}{5}$ is oe for 0.8, $\frac{5}{4}$ is oe for 1.25, $\frac{1}{80}$ is oe for 0.0125		M1

Question	Answer	Mark	Comments
6(b)	**Alternative method 1 – answer in (a) correct or answer in (a) not used**		
	Ticks the box The total cost is **less** than my answer to part (a) and correct reason	B2	correct reasons include more tracks cost less 10(p) (less) (costs) (£)11.1(0) B1 Ticks the box The total cost is **less** than my answer to part (a)
	Alternative method 2 – answer in (a) incorrect and used for comparison		
	Ticks the box for the correct decision for comparison with their answer in part (a) and correct reason from comparison with their answer in part (a)	B2ft	B1ft Ticks the box for the correct decision for comparison with their answer in part (a)

Additional Guidance is on the next page

6(b) cont	**Additional Guidance**	
	Condone irrelevant statements with a correct reason	
	Do not accept an incorrect reason with a correct reason	
	Examples of correct reasons	
	6 x 0.85 = 5.1, 8 x 0.75 = 6, 6 + 5.1 = 11.1	
	+ 30p – 40p	
	2 tracks less by 5p means 10p	
	8 is more than 6 and cancels the 6 5ps added as 8 5ps taken away	
	Only 6 tracks cost 5p more on each and 8 tracks cost 5p less on each, so the 8 tracks that are less take away the extra money you pay for 6	
	The cost of 8 tracks is less by 5p each, but the cost of 6 tracks is more by 5p, this means that everything cancels apart from 2 of the 8 tracks	
	The first 6 are 5p more, the last 8 are 5p less this means it is cheaper	
	You are taking 5p off more tracks than you are adding 5p	
	Cost is less as adding 5p on only 6 but taking away 5p on 8	
	8 less by 5p, 6 more by 5p, 8 is more than 6	
	Examples of incorrect reasons	
	As 6 tracks are 5p more on each but 8 tracks are 5p less on each (no reference to 8 being greater than 6)	
	8 tracks is more than 6 tracks (no reference to cost)	
	Because 8 – 6 = 2 so therefore there are 2 less (no reference to cost)	
	Because 8 tracks is less by 5p so 16 will be less by 10p	
	If the tracks are cheaper then the total price will be cheaper (referring to the cost of all 14 tracks being 5p cheaper)	
	The more tracks, the less money each is worth by 5p each (referring to the cost of all 14 tracks being 5p cheaper)	
	Because there are more than 8 tracks on B so it's less because it's 5p less for each track (referring to the cost of all 14 tracks being 5p cheaper)	

Question	Answer	Mark	Comments
7	**Alternative method 1**		
	4.5 × 2 or 9 and 5 × 2 or 10 and 1.5 × 2 or 3	M1	allow one error or omission
	their 9 × 3 and their 10 × 4 and their 3 × 5 or 27 and 40 and 15	M1dep	their numbers of houses must be whole numbers
	82	A1	
	Alternative method 2		
	4.5 × 3 and 5 × 4 and 1.5 × 5 or 13.5 and 20 and 7.5 or 41	M1	allow one error or omission
	2 × (4.5 × 3 + 5 × 4 + 1.5 × 5) or 2 × (their 13.5 + their 20 + their 7.5) or 2 × their 41	M1dep	
	82	A1	
	Additional Guidance		
	Two of 27, 40 and 15 correct implies first method mark		M1M0
	22 without working		M0

Question	Answer	Mark	Comments
8	**Alternative method 1**		
	Subtracts 17, 34, 51 or 68 from 84 or subtracts any multiple of 3 from 84 or subtracts any three equal positive whole numbers from 84	M1	implied by 67, 50, 33 or 16 or implied by a multiple of 17 plus three positive whole numbers that sum to 84 or implied by a multiple of 3 and another positive whole number that sum to 84 or implied by four positive whole numbers, three of which are equal, that sum to 84
	Subtracts 17, 34, 51 or 68 from 84 and then divides by 3 or subtracts any multiple of 3 from 84 and then divides by 17 or subtracts any three equal positive whole numbers from 84 and then divides by 17	M1dep	implied by 22.3(…), 16.6(…) or 16.7, 11 or 5.3(…)
	51, 11, 11, 11	A1	any order
	Alternative method 2		
	A correctly evaluated trial using addition of a multiple of 17 and three equal positive whole numbers or addition of a multiple of 17 and a multiple of 3	M1	
	A different correctly evaluated trial using addition of a multiple of 17 and three equal positive whole numbers or addition of a multiple of 17 and a multiple of 3	M1dep	
	51, 11, 11, 11	A1	any order

Additional Guidance is on the next page

8 cont	**Additional Guidance**	
	Answer of 51 and 11 with indication of three 11s in working	M1M1A1
	Answer line blank with 51 and three 11s indicated as their four numbers	M1M1A1
	Answer line blank with 51 and three 11s in working	M1M1A0
	Answer of 51 and 11 with no indication of three 11s in working	M1M1A0
	34, 20, 20, 10 implies first method mark as a multiple of 17 plus three positive whole numbers that sum to 84	M1M0

Question	Answer	Mark	Comments
9	116(.00)	B4	B3 3 × 34.5(0) + 12.5(0) or 118.25 or 119 or 122 or 121.25 B2 58.75 + 34.5(0) + 2 × 12.5(0) or 2 × 34.5(0) + 4 × 12.5(0) or 34.5(0) + 7 × 12.5(0) or 58.75 + 5 × 12.5(0) B1 10 × 12.5(0) or 125 or 2 × 58.75 or 117.5(0) or 34.5(0) ÷ 3 or 11.5(0) or 58.75 ÷ 5 or 11.75
	Additional Guidance		
	116(.00) identified as answer		B4
	116 in working with different answer		B3
	116.0		B3
	Answer of 117.5(0) with 122 in working		B3

Question	Answer	Mark	Comments
10	**Alternative method 1**		
	180 ÷ 3 or 60	M1	
	90 – their 60 or 30	M1dep	
	180 – 65 – their 30	M1dep	85 marked on *AED*
	85	A1	
	Alternative method 2		
	90 – 65 or 25	M1	
	180 – 2 × (90 – 65) or 2 × 65 or 180 – 2 × their 25 or 130	M1dep	
	(360 – (180 ÷ 3) – their 130) ÷ 2 or 170 ÷ 2	M1dep	85 marked on *AED*
	85	A1	
	Additional Guidance		
	Correct angles could be marked on diagram		
	85 on answer line with no working or angles marked on diagram		M1M1M1A1
	60, 30, 25 or 130 on answer line with no working and not marked correctly on diagram		M0
	On Alt 1, 60 with no working and incorrectly marked on diagram		M0

Question	Answer	Mark	Comments
11(a)	+ 2	B1	
	Additional Guidance		
	$+ \frac{10}{5}$	B0	
	$a + 2$	B0	
11(b)	$(y =) \frac{x}{2} + 4$	B1	oe eg $(y =) 0.5x + 4$ or $(y =) \frac{x+8}{2}$
	Additional Guidance		
	Condone $x \div 2 + 4$	B1	
12	15	B1	
13	41, 43 and 47	B2	B1 at least two of 41, 43 and 47 with at most one other number
	Additional Guidance		

Question	Answer	Mark	Comments
14	**Alternative method 1**		
	3115 ÷ 6.23 or 500	M1	3115 × 0.028 or 87.22
	their 500 × 0.028	M1dep	their 87.22 ÷ 6.23
	14	A1	
	Alternative method 2		
	6.23 ÷ 0.028 or 222.5	M1	6.23 ÷ 3115 or 0.002 or $\frac{1}{500}$
	3115 ÷ their 222.5	M1dep	0.028 ÷ their 0.002 or 0.028 ÷ their $\frac{1}{500}$
	14	A1	
	Alternative method 3		
	0.028 ÷ 6.23 or 0.00449(…) or 0.0045 or $\frac{2}{445}$	M1	
	3115 × their 0.00449(…) or 3115 × 0.0045 or 3115 × their $\frac{2}{445}$	M1dep	
	14	A1	
	Additional Guidance		
	500 × 0.028 and 14 × 0.028		M1M1A0
	500 × 0.028 and 14^3		M1M1A0
	500×0.028^3		M1M0
15	$\frac{1}{3} \neq 30\%$	B1	
16	parallelogram	B1	

Question	Answer	Mark	Comments
17(a)	Exactly ten options VV VS VC VM SS SC SM CC CM MM or exactly sixteen options VV VS VC VM SV SS SC SM CV CS CC CM MV MS MC MM	B2	may be given as words B1 any six correct options from the sixteen options
	Additional Guidance		
	Both correct sixteen options listed and correct ten options listed		B2

17(b)	**Alternative method 1**		
	360 ÷ 180 or 2	M1	implied by a correct angle or implied by a correctly drawn angle in pie chart ± 2°
	Any two of 45 × their 2 or 90° 75 × their 2 or 150° 50 × their 2 or 100° 10 × their 2 or 20°	M1dep	implied by any two correctly drawn angles in pie chart ± 2°
	Pie chart with four sectors drawn, two of which are correctly drawn with angles from 90°, 150°, 100° and 20°	M1dep	± 2° lines must be ruled
	Fully correct pie chart and sectors labelled with flavours	A1	± 2° lines must be ruled

Mark scheme for Question 17(b) continues on next page

Question	Answer	Mark	Comments
17(b) cont	**Alternative method 2**		
	45 ÷ 180 × 100 or 25% or 75 ÷ 180 × 100 or $41\frac{2}{3}$% or 42% or 50 ÷ 180 × 100 or $27\frac{7}{9}$% or 28% or 10 ÷ 180 × 100 or $5\frac{5}{9}$% or 6%	M1	oe
	Any two of 45 ÷ 180 × 360 or 90° 75 ÷ 180 × 360 or 150° 50 ÷ 180 × 360 or 100° 10 ÷ 180 × 360 or 20°	M1dep	implied by any two correctly drawn angles in pie chart ± 2°
	Pie chart with four sectors drawn, two of which are correctly drawn with angles from 90°, 150°, 100° and 20°	M1dep	± 2° lines must be ruled
	Fully correct pie chart and sectors labelled with flavours	A1	± 2° lines must be ruled
	Additional Guidance		
	All four sectors must be correctly labelled with letters or words for the accuracy mark		

Question	Answer	Mark	Comments
18	Isosceles triangle with base 2 cm and height 3 cm in any orientation	B2	± ¼ square on base or height B1 isosceles triangle with base 2 cm or height 3 cm in any orientation or acute angled triangle with base 2 cm and height 3 cm in any orientation
	Additional Guidance		
	Mark intention for isosceles triangle within tolerance, lines do not need to be ruled		
	Enlargement can be drawn wholly or partially inside the original		
	Correct vertices not connected		B1
	Right angled isosceles triangle		B0

Question	Answer	Mark	Comments
19(a)	$2a^2 + 15a - 1$	B3	B2 $2a^2 + 15a$ or $2a^2 - 1$ or $15a - 1$ B1 $2a^2$ or $15a$ or -1
	Additional Guidance		
	$2a + 15a - 1 = 17a - 1$		B2
	$2a^2 + 15a + -1$		B2
	Do not ignore further incorrect algebraic simplification for B3 $2a^2 + 15a - 1 = 17a - 1$		B2
	Do not ignore further incorrect algebraic simplification for B2 $2a + 15a - 1 = 17a - 1 = 16a$ $2a^2 + 15a - 1 = 17a - 1 = 16a$		B1

Question	Answer	Mark	Comments
19(b)	$4y(6y – 5)$ or $–4y(5 – 6y)$	B2	B1 $2y(12y – 10)$ or $–2y(10 – 12y)$ or $y(24y – 20)$ or $–y(20 – 24y)$ or $4(6y^2 – 5y)$ or $–4(5y – 6y^2)$ or $2(12y^2 –10y)$ or $–2(10y – 12y^2)$
	Additional Guidance		
	Ignore any 'solutions' seen eg $4y(6y – 5)$ in working with 0 and $\frac{5}{6}$ on answer line		B2
	Condone $4y \times (6y – 5)$		B2
	Condone $y \times (24y – 20)$		B1
	$(4y + 0)(6y – 5)$		B1
	Do not ignore further incorrect algebraic simplification for B2		
20	$(x =)$ 14 and –14	B2	B1 $(x =)$ 14 or $(x =)$ –14
	Additional Guidance		

Question	Answer	Mark	Comments
21	8.5(0) or 9.49 or 9.5(0) or 6.25 or 6.74 or 6.75	B1	
	9.49 + 6.74 or (9, 9.5] + (6.5, 6.75]	M1	
	16.23	A1	accept (£)16.23p SC2 16.25 or 16.24
	Additional Guidance		
	9.5(0) and 6.55 with answer 16.05		B1M1A0
	9.4(0) and 6.25 with answer 15.65		B1M0A0
	9.4(0) and 6.55 with answer 15.95		B0M1A0

Question	Answer	Mark	Comments
22(a)	22.6 or $\frac{113}{5}$ or $22\frac{3}{5}$	B1	
	Additional Guidance		
	Condone $22\frac{6}{10}$		B1
22(b)	**Alternative method 1**		
	n^2 will be positive and $\frac{12}{n}$ will be negative and positive – negative = positive	B2	oe B1 n^2 will be positive or $\frac{12}{n}$ will be negative
	Alternative method 2		
	n^2 will be positive and $-\frac{12}{n}$ will be positive and positive + positive = positive	B2	oe B1 n^2 will be positive or $-\frac{12}{n}$ will be positive
	Additional Guidance		
	For 'n^2 will be positive' accept the square of a negative number is a positive		
	For 'n^2 will be positive' condone square or squared numbers are positive		
	For 'positive – negative = positive' condone +(ve) – –(ve) = +(ve)		

Question	Answer	Mark	Comments
23	**Alternative method 1**		
	900 ÷ 600 or 1.5	M1	oe implied by 4.30 (pm) or 16.30
	(8 – 3) – their 1.5 or 5 – their 1.5 or 3.5	M1dep	oe
	their 3.5 × 720	M1dep	oe
	2520	A1	
	Alternative method 2		
	$900 \div \frac{600}{60}$ or 900 ÷ 10 or 90	M1	oe implied by 4.30 (pm) or 16.30
	(8 – 3) – (their 90 ÷ 60) or 5 – (their 90 ÷ 60) or 3.5 or (8 – 3) × 60 – their 90 or 5 × 60 – their 90 or 210	M1dep	oe
	their 3.5 × 720 or their 210 × 720 ÷ 60	M1dep	oe
	2520	A1	
	Additional Guidance		
	Condone 3:30 or 3.30 for 3.5(hours)		M1M1
	Condone 1:30 or 1.30 for 1.5(hours)		M1

Question	Answer	Mark	Comments
24	6 as density for J or K	B1	
	13 as volume for K or 78 ÷ their 6 as volume for K	B1ft	ft their 6
	g/cm^3 as units for densities of J and K and cm^3 as unit for volume of K	B1	allow g cm^{-3}
	Additional Guidance		
	Mark table first		
	Full marks are only awarded for a fully correct table with no errors or omissions		
	13 cm^3 as a volume for K, 0.006 kg/cm^3 for both densities		B1B1B1
	Condone g per cm^3, gpcm^3 or g per cubic centimetre as units for density		

Question	Answer	Mark	Comments
25	**Alternative method 1 – PQ as the unknown**		
	$x + 10$ or $2(x + 10)$	M1	any unknown
	$x + x + 10 + 2(x + 10) = 170$	M1dep	oe any consistent unknown x + their two expressions (with at least one correct) = 170
	$4x + 30 = 170$	M1dep	oe $4x = 140$ must be correct
	35	A1	
	Alternative method 2 – PR as the unknown		
	$x – 10$ or $2x$	M1	any unknown
	$x + x – 10 + 2x = 170$	M1dep	oe any consistent unknown x + their two expressions (with at least one correct) = 170
	$4x – 10 = 170$ or $x = 45$	M1dep	oe $4x = 180$ must be correct
	35	A1	
	Alternative method 3 – QR as the unknown		
	$\frac{x}{2}$ or $\frac{x}{2} – 10$	M1	any unknown
	$x + \frac{x}{2} + \frac{x}{2} – 10 = 170$	M1dep	oe any consistent unknown x + their two expressions (with at least one correct) = 170
	$2x – 10 = 170$ or $x = 90$	M1dep	oe $2x = 180$ must be correct
	35	A1	

Mark scheme for Question 25 continues on next page

Question	Answer	Mark	Comments
25 cont	**Alternative method 4 – trial and improvement with addition of three lengths**		
	A correctly evaluated trial with a difference of 10 (km) between the two shorter lengths and the longest length twice the length of the middle length	M1	may be seen as a subtraction of three numbers from 170
	A different correctly evaluated trial with a difference of 10 (km) between the two shorter lengths and the longest length twice the length of the middle length	M1dep	may be seen as a subtraction of three numbers from 170
	35, 45 and 90	A1	
	35	A1	
	Alternative method 5 – trial and improvement with subtraction from 170		
	A correctly evaluated trial of two lengths subtracted from 170 with a difference of 10 (km) between the two lengths or one length twice the length of the other	M1	
	A different correctly evaluated trial of two lengths subtracted from 170 with a difference of 10 (km) between the two lengths or one length twice the length of the other	M1dep	
	35, 45 and 90	A1	
	35	A1	

Additional Guidance is on the next page

25 cont	**Additional Guidance**	
	If the student attempts more than one method, mark each method and award the highest mark	
	Alt 1 $PQ + PQ + 10 + 2(PQ + 10) = 170$	M1M1
	Alt 1 $PQ + PQ + 10 + 2PR = 170$	M1
	Alt 2 x, $x + 10$ and $2x$ seen on diagram, $4x + 10 = 170$	M1M1M0A0
	Alt 4 $35 + 45 + 90$ with no choice made	M1M1A1A0
	Alt 4 $170 – 30 – 40 – 80 = 20$	M1
	Alt 4 $170 – 30 – 40 – 60 = 40$ incorrect number is doubled	M0
	Alt 5 $170 – 30 – 60 = 80$	M1

Question	Answer	Mark	Comments
26	**Alternative method 1**		
	6000 × 1.03 or 6180 or 6000 × 0.03 or 180 or 6000 × 1.01 or 6060 or 6000 × 0.01 or 60	M1	6000 × 1.05 or 6300 6000 × 0.05 or 300
	their 6180 × 1.03 or 6365.4(0) or their 6180 × 0.03 or 185.4(0) or 365.4(0) or their 6060 × 1.05 or 6363 or their 6060 × 0.05 or 303 or 363	M1dep	6000×1.03^2 or 6000 × 1.0609 or 6000 × 1.01 × 1.05 or 6000 × 1.0605 or 6300 × 1.01 or 6300 × 0.01 or 63
	6365.4(0) and 6363 and No or 365.4(0) and 363 and No	A1	accept 2.4(0) difference to imply 'No'
	Alternative method 2		
	1.03 or 1.01 or 1.05	M1	
	1.03^2 or 1.03 × 1.03 or 1.0609 or 0.0609 or 6.09(%) or 1.01 × 1.05 or 1.0605 or 0.0605 or 6.05(%)	M1dep	
	1.0609 and 1.0605 and No or 0.0609 and 0.0605 and No or 6.09(%) and 6.05(%) and No	A1	accept 0.0004 difference to imply 'No' accept 0.04(%) difference to imply 'No'

Additional Guidance is on the next page

26 cont	**Additional Guidance**	
	Accept any clear indication that the Offer 1 amount is different to the Offer 2 amount for 'No'	
	If build up methods are used they must be complete	
	6000×0.03^2 implies 6000×0.03	M1
	1.03^3 implies 1.03	M1
	360 without 180 seen (simple interest)	M0
	If a different starting value is used, apply Alt 2 with correctly evaluated answers eg $600 \times 1.03^2 = 636.54$ $600 \times 1.01 \times 1.05 = 636.30$ No, pay less with Offer 1 (condone incorrect choice of Offer 1) $500 \times 1.03 = 515$ $515 \times 1.03 = 530.45$ $500 \times 1.01 = 505$ $505 \times 1.05 = 530.25$ No, they are different	M1M1A1 M1M1A1

Question	Answer	Mark	Comments
27	(200 + 160 + 104 + 100) ÷ 4 or 564 ÷ 4 or 141	M1	
	their 141 ÷ 3 × 8 or 47 × 8 or 1128 ÷ 3 or 376	M1dep	oe accept 141 × 2.66(…) or 141 × 2.67
	their 376 × 5 or 1880	M1dep	
	427	A1	
	Additional Guidance		
	(270 + 400 + 483 + 300 + 427) ÷ 5 embedded answer		M1M1M1A0
	(1453 + x) ÷ 5 = 376 and 1453 + x = 1880		M1M1M1
	(1453 + x) ÷ 5 = 376		M1M1M0
	200 + 160 + 104 + 100 ÷ 4 scores M0 unless recovered		

Question	Answer	Mark	Comments
28	**Alternative method 1**		
	$4 \times 5 + c = 23$	M1	oe $20 + c = 23$
	$c = 3$	A1	implied by (0, 3) or 3 shown as y-axis intercept
	$y = 4x + 3$	A1	SC1 $y = 4x + c$ $c \neq 3$
	Alternative method 2		
	$y - 23 = 4(x - 5)$	M1	oe
	$y - 23 = 4x - 20$	M1dep	
	$y = 4x + 3$	A1	SC1 $y = 4x + c$ $c \neq 3$
	Additional Guidance		
	If 3 is clearly linked to c in $y = mx + c$ condone M1A1		
	$4x + 3$ on answer line, $y = 4x + 3$ seen in working		M1A1A1
	$4x + 3$ on answer line, $y = 4x + 3$ not seen in working		M1A1A0
	$m = 4$, $c = 3$ on answer line, $y = 4x + 3$ seen in working		M1A1A1
	$m = 4$, $c = 3$		M1A1A0
	$y = mx + 3$		M1A1A0
	$23 = 4 \times 5 + 3$ embedded value for c		M1A0A0
	$4x + c$ on answer line with $c \neq 3$		M0A0A0
29	27 cm	B1	

Question	Answer	Mark	Comments
30	**Alternative method 1**		
	$\sin x = \frac{13}{16}$ or $\sin^{-1}\frac{13}{16}$	M1	oe $\sin x = 0.8125$
	54(.3…)	A1	
	Alternative method 2		
	$\cos x = \frac{13}{16}$ or $\cos^{-1}\frac{13}{16}$ and 90 – their [35.6, 36]	M1	oe
	54(.3…)	A1	
	Alternative method 3		
	$\cos x = \frac{\sqrt{16^2 - 13^2}}{16}$ or $\tan x = \frac{13}{\sqrt{16^2 - 13^2}}$	M1	oe
	54(.3…)	A1	
	Additional Guidance		
	$\sin = \frac{13}{16}$ or $\sin \frac{13}{16}$ or $\sin^{-1} = \frac{13}{16}$ unless recovered		M0
	Answer 54 from scale drawing with no trigonometry		M0A0