GCSE MATHEMATICS 8300/2F

Foundation Tier Paper 2 Calculator

Mark scheme

June 2025

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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.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

Further copies of this mark scheme are available from aqa.org.uk

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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(a)	11	B1	
	Additional Guidance		
	Condone $11 + 8 = 19$ on the answer line or in the working if the answer line is blank	B1	
	$11 + 8 = 19$ in the working and 19 on the answer line	B0	

Q	Answer	Mark	Comments
1(b)	8	B1	
	Additional Guidance		
	Condone $3 \times 8 = 24$ on the answer line or in the working if the answer line is blank	B1	
	$3 \times 8 = 24$ in the working and 24 on the answer line	B0	

Q	Answer	Mark	Comments
1(c)	13	B1	
	Additional Guidance		
	Condone $20 - 13 = 7$ on the answer line or in the working if the answer line is blank	B1	
	$20 - 13 = 7$ in the working and 7 on the answer line	B0	

Q	Answer	Mark	Comments
2(a)	47	B1	

Q	Answer	Mark	Comments
2(b)	78	B1	
	Additional Guidance		
	Ignore any additional words eg animals		

Q	Answer	Mark	Comments
3(a)	East	B1	
	Additional Guidance		
	Any unambiguous indication eg due East or Easterly or E		B1
	Ignore any reference to a distance		
	090		B1
	90		B0
	2 directions chosen on the answer line is choice		B0
	Right		B0

Q	Answer	Mark	Comments
3(b)	4×10 or 40 or 3×10 or 30 or $4 + 3$ or 7	M1	may be on the diagram
	70	A1	SC1 50
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	SC1 for using the direct distance from A to C		
	Further work eg1 $3 \times 10 + 4 = 34$ eg2 70 found then $70 \div 2 = 35$		 M1A0 M1A0

Q	Answer	Mark	Comments
4(a)	ab or ba	B1	
	Additional Guidance		
	Allow upper case A and/or B		
	Do not accept $a \times b$ or $b \times a$ or a^b or b^a		

Q	Answer	Mark	Comments
4(b)	$3c$	B1	
	Additional Guidance		
	Do not accept $c3$ or $3 \times c$ or $c \times 3$		

Q	Answer	Mark	Comments
4(c)	p^3	B1	
	Additional Guidance		
	Do not accept $p3$		

Q	Answer	Mark	Comments
4(d)	1	B1	
	Additional Guidance		
	Do not accept $\frac{1}{1}$		

Q	Answer	Mark	Comments
5	400 + 250 + 380 or 1030 or 400 ÷ 1000 or 0.4 or 250 ÷ 1000 or 0.25 or 380 ÷ 1000 or 0.38 or 1000	M1	oe
	1030 and 1000 or 1.03 or 1030 and 30 (metres) more/extra or 1000 and 30 (metres) more/extra	A1	oe eg 1km 30m SC1 10.3
	Additional Guidance		
	Ignore trailing 0s in decimals eg 1.030		
	Ignore inequality signs		
	After 1000 and 1030 seen ignore irrelevant further incorrect conversion of units eg 1000 and 400 + 250 + 380 = 1030 = 1.3km		M1A1
	Adds an extra distance, eg 1030 shown followed by 1030 + 380		M1A0

Q	Answer	Mark	Comments
6	11 or 20 or 14	B1	may be on diagram implied by 5
	$50 - 11 - 20 - 14$ or 5	M1	oe allow one error in 11, 20 or 14 may be implied by the height of the bar
	All four of : • bar drawn to height 5 • same width as other bars • all gaps between bars equal • bar drawn with intended straight lines	A2	A1 two or three of the four bullets met mark intention ignore shading
	Additional Guidance		
	A bar that satisfies all four criteria with no working		B1M1A2
	A bar of height 3 that has no working and meets 3 of the bullet points		B0M0A0

Q	Answer	Mark	Comments
7	$\frac{4}{5}$	B2	B1 equivalent fraction eg $\frac{80}{100}$ or $\frac{0.8}{1}$ SC1 0.8 or 80%
	Additional Guidance		
	B1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	For B1 condone inclusion of a common unit eg1 $\frac{80p}{100p}$ eg2 $\frac{80}{100}$p eg2 $\frac{80p}{£1}$		B1 B1 B0

Q	Answer	Mark	Comments
8(a)	210	B1	

Q	Answer	Mark	Comments
8(b)	1.4	B1	
	Additional Guidance		
	Condone trailing zeros eg 1.40		B1

Q	Answer	Mark	Comments
8(c)	$32 \div 8$ or 4 or 32×5 or 160 or $5 \div 8$ or 0.625 or $8 \div 5$ or 1.6	M1	oe eg $8 + 8 + 8 + 8 = 32$ or 8, 16, 24, 32
	20	A1	

Q	Answer	Mark	Comments
9(a)	2:30pm or 14:30	B1	
	Additional Guidance		
	Condone 14:30 pm or half past two in the afternoon		B1
	2:30 am or 2:30 or half past two		B0

Q	Answer	Mark	Comments
9(b)	**Alternative method 1**		
	$8 \div 4$ or 2	M1	oe may be seen by the table
	their 2×60 or 120	M1dep	oe may be seen by the table
	120 and Yes	A1	oe eg Yes and 80 minutes more
	Alternative method 2		
	8×60 or 480	M1	oe may be seen by the table
	$\frac{1}{4}$ × their 480 or 120	M1dep	oe may be seen by the table
	120 and Yes	A1	oe eg Yes and 80 minutes more
	Alternative method 3		
	8×60 or 480	M1	oe may be seen by the table
	$\frac{200}{8 \times 60}$ or $\frac{200}{480}$	M1dep	oe fraction, decimal or percentage eg $0.41\dot{6}$
	$\frac{5}{12}$ and $\frac{3}{12}$ and Yes	A1	oe fractions with common denominator or decimals or percentages eg $0.41\dot{6}$ and 0.25
	Alternative method 4		
	8×60 or 480	M1	oe may be seen by the table
	200×4 or 800	M1	oe may be seen by the table
	480 and 800 and Yes	A1	oe
	Alternative method 5		
	$8 \div 4$ or 2	M1	oe may be seen by the table
	$200 \div 60$ or $3\frac{1}{3}$ or 3.(…)	M1	oe eg 3 hours 20 minutes may be seen by the table
	2 and 3.(…) and Yes or 2 and $3\frac{1}{3}$ and Yes	A1	oe eg Yes and 2 hrs and 3 hrs 20 mins eg Yes and 80 minutes more

The Additional Guidance for Question 9b is on the next page

9b cont	**Additional Guidance**	
	Lists: 1h = 60, 2h = 120, 3h = 180, 4h = 240 … up to 8h = 480 would gain M1 from alts 2, 3, or 4 for converting 8h to 480 minutes 2h = 120 needs to be chosen from the list or at the end of the list to gain M2 from alt 1	
	Accept any unambiguous indication for ticking a box	
	Ignore any reference to Margot	
	Accept $0.41\dot{6}$ and $41.\dot{6}$ rounded or truncated to at least 2 sf	
	Alts 4 and 5 the second method mark is independent	

Q	Answer	Mark	Comments
10(a)	30	B1	
	Additional Guidance		
	Further work eg $\frac{1}{4} \times 30 = 7.5$		B0

Q	Answer	Mark	Comments
10(b)	15 ÷ 6 or 2.5 or 6 ÷ 3 or 2 or 6 ÷ 15 or 0.4 or 3 ÷ 6 or 0.5 or $\frac{x}{15} = \frac{3}{6}$ or $\frac{x}{15} = 0.5$	M1	oe may be seen on the diagram
	7.5 or $7\frac{1}{2}$ or $\frac{15}{2}$	A1	
	Additional Guidance		
	Accept correct answer unambiguously placed as x on the diagram provided it is not contradicted in the working space.		

Q	Answer	Mark	Comments
11	**Alternative method 1: expands brackets and simplifies**		
	$7x - 14$ or $15x + 10$	M1	
	$7x - 14$ $(+ 4x + 6)$ and $11x - 8$ or $15x + 10$ $(- 4x - 18)$ and $11x - 8$	M1dep	A or B fully correct
	$7x - 14$ $(+ 4x + 6)$ and $11x - 8$ and $15x + 10$ $(- 4x - 18)$ and $11x - 8$	A1	A and B fully correct SC1 $11x - 8$ for one or both of A and B with no working seen
	Alternative method 2: shows the x terms and constant terms are the same		
	Any one of $7x + 4x = 11x$ or $15x - 4x = 11x$ or $-14 + 6 = -8$ or $10 - 18 = -8$	M1	
	Any two of $7x + 4x = 11x$ or $15x - 4x = 11x$ or $-14 + 6 = -8$ or $10 - 18 = -8$	M1dep	
	$7x + 4x = 11x$ and $15x - 4x = 11x$ and $-14 + 6 = -8$ and $10 - 18 = -8$	A1	SC1 $11x - 8$ for one or both of A and B with no working seen
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Use the scheme that favours the student		
	Alt 2: $7x + 4x = 11x$ and $-14 + 6 = -8$		M1M1
	Alt 2: $7x + 4x = 11x$ and $15x - 4x = 11x$		M1M1
	Alt 2: $11x$ only		M0
	Alt 2: – 8 only		M0
	Do not ignore subsequent incorrect work such as $11x - 8 = 3$, which may be awarded up to M2 if working shown		
	Substituting values into the two expressions		M0

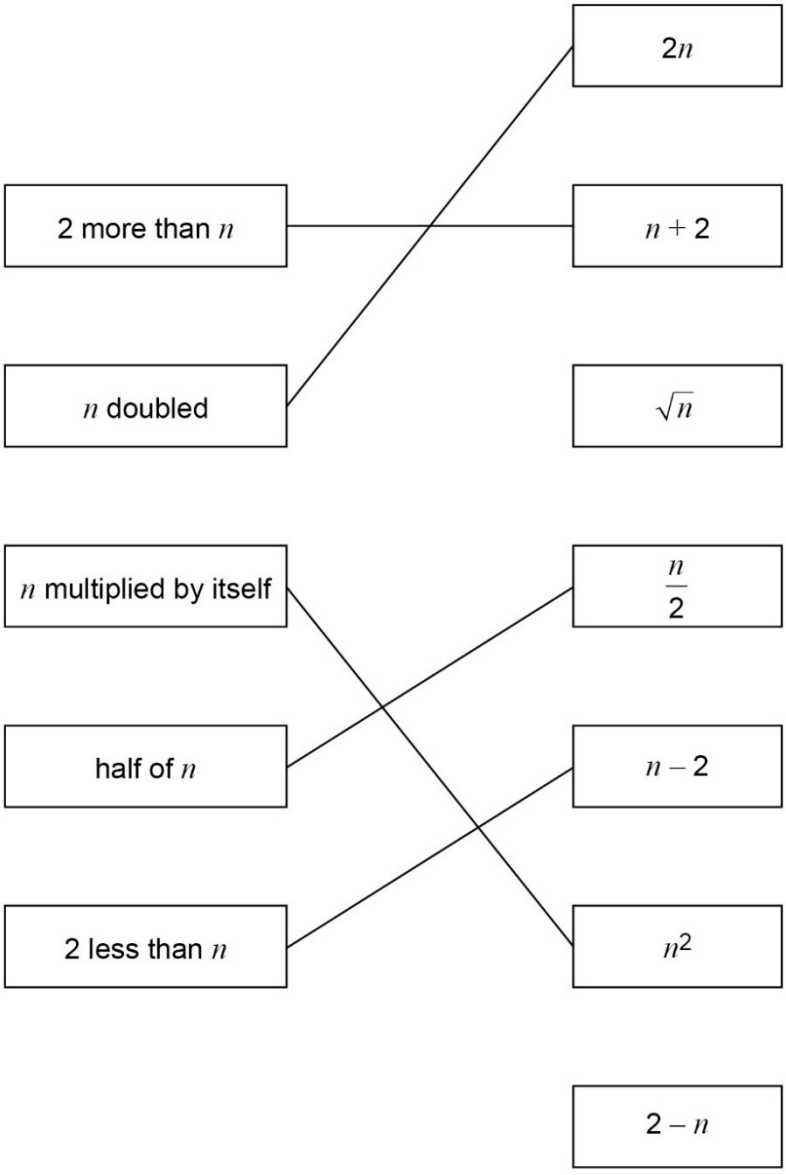
Q	Answer	Mark	Comments
12	2.2(0) ÷ 4 or 0.55 or $\frac{7}{4}$ or $\frac{4}{7}$ or 0.57(1…)	M1	oe eg 220 ÷ 4 or 55 implied by 385
	3.85	A1	
	Additional Guidance		
	Allow working in pence		
	Answer 3.85p Answer 385p with £ sign crossed out Answer 385p without £ sign crossed out		M1A1 M1A1 M1A0

Q	Answer	Mark	Comments
13(a)	65	B1	

Q	Answer	Mark	Comments
13(b)	**Alternative method 1: works with total**		
	178 × 5 or 890 or $(140 + 168 + 205 + 192 + x) \div 5$ or $(705 + x) \div 5$	M1	oe any letter
	their 890 – (140 + 168 + 205 + 192) or their 890 – 705 or $(705 + x) \div 5 = 178$	M1dep	oe
	185	A1	SC2 3 hrs 5 (minutes)
	Alternative method 2: works with differences from new mean		
	140 – 178 and 168 – 178 and 205 – 178 and 192 – 178 or –38 and –10 and 27 and 14 or 38 and 10 and –27 and –14	M1	subtractions may be the other way round
	–7 or 7	M1dep	
	185	A1	SC2 3 hrs 5 (minutes)
	Alternative method 3: works from the mean of the 4 given values		
	178 – (140 + 168 + 205 + 192) ÷ 4 or 178 – 705 ÷ 4 or 178 – 176.25 or 1.75 or –1.75	M1	oe eg 4 × 178 – 705 subtraction may be the other way round
	4 × their 1.75 or 7 or –7	M1dep	oe
	185	A1	SC2 3 hrs 5 (minutes)

The Mark scheme for Question 13b continues on the next page

13b cont	**Alternative method 4: trial and improvement**		
	Trial of any value with mean correctly evaluated	M1	
	Trial of 185 with mean evaluated to 178	M1dep	eg (140 + 168 + 205 + 192 + 185) ÷ 5 = 178
	185	A1	SC2 3 hrs 5 (minutes)
	Alternative method 5: numerical solution of (140 + 168 + 205 + 192 + x) ÷ 5 = 178		
	178 – (140 + 168 + 205 + 192) ÷ 5 or 178 – 705 ÷ 5 or 178 – 141 or 37	M1	oe
	their 37 × 5	M1dep	oe
	185	A1	SC2 3 hrs 5 (minutes)
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	In alt 4 ignore trials which are not evaluated or are evaluated incorrectly		
	In alt 4 accept if the mean is given to the next or previous integer eg trial of 178 (140 + 168 + 205 + 192 + 178) ÷ 5 = 176 (or 177 or 176.6)		M1
	Accept working in hours and minutes for M2 178 = 2hrs 58mins 140 = 2hrs 20mins 168 = 2hrs 48mins 205 = 3hrs 25mins 192 = 3hrs 12mins		
	SC2 is for 185 in hours and minutes		

Q	Answer	Mark	Comments
14	All 4 correct matches $2n$ n^2 $\frac{n}{2}$ $n-2$	B4	B1 for each correct match
	Additional Guidance		
	Accept any unambiguous indication		
	More than one line from a box on the left is incorrect for that box		
			

Q	Answer	Mark	Comments
15	Yes with valid working	B1	eg Yes and 6 + 10 + 6 + 10 (= 32)
	Additional Guidance		
	Yes ticked without valid reason		B0
	Ignore any area calculations		
	Accept any unambiguous indication for ticking a box		
	Neither box ticked but yes implied eg 6 + 10 + 6 + 10 so it is 32		B1
	Yes ticked and 2 × (10 + 6) = 32		B1
	Yes ticked and 2 lots of 10 and 2 lots of 6 make 32		B1
	Yes ticked and 20 + 12 = 32		B1
	Yes ticked and draws a rectangle indicating the sides are 10 and 10 and 6 and 6 and states 'you add the sides to get the perimeter'		B1
	Yes ticked and draws a rectangle indicating that the sides are 10 and 10 and 6 and 6 with no explanation		B0
	Yes ticked and the sides are 10 and 6 so perimeter is 32		B0
	Yes ticked and because 60 ÷ 10 is 6/correct		B0
	Yes ticked and 6 + 10 + 6 + 10 with an incorrect total		B0

Q	Answer	Mark	Comments
16	$b - 3$ or $-3 + b$	B1	
	Additional Guidance		
	Allow upper case B but not a change of letter eg $a = B - 3$		B1
	$b - +3$ or $b + -3$		B0
	$3 - b$		B0

Q	Answer	Mark	Comments
17	**Alternative method 1: uses values from both A and B**		
	Method to find the cost of any mass for either packet or a correct cost stated or Method to find the number of grams for any cost for either packet or a correct mass stated or Method to find the differences between masses and costs or £1.50 and 300g stated	M1	eg 1.1(0) ÷ 2 eg 2.6(0) × 2 eg 200 ÷ 1.1(0)
	Fully correct method or values for two comparable/corresponding masses or costs	M1dep	eg 1.10 × 5 and 2.60 × 2 eg 1.10 ÷ 2 and 2.60 ÷ 5
	Packet B with correct comparable values	A1	eg B and 0.55 and 0.52 eg B and 182 and 192

The mark scheme for Question 17 continues on the next page

17 cont	**Alternative method 2: scales up from A or down from B**		
	$\frac{2.6}{1.1}$ or 2.36(3…) or 2.364 or $\frac{1.1}{2.6}$ or 0.423(0…) or 0.4231 or $\frac{500}{200}$ or 2.5 or $\frac{200}{500}$ or 0.4	M1	oe
	$\frac{2.6}{1.1} \times 200$ or [472, 473] or $\frac{1.1}{2.6} \times 500$ or [211, 212] or $\frac{500}{200} \times 1.1(0)$ or 2.75 or $\frac{200}{500} \times 2.6(0)$ or 1.04	M1dep	oe
	Packet B and one correct comparable value stated	A1	eg B and 472 eg B and (£)2.75

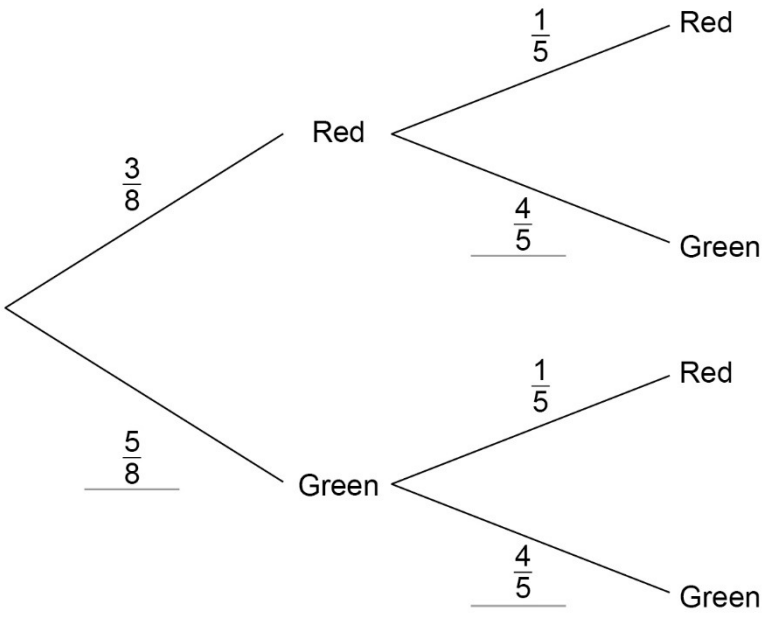
The Additional Guidance for Question 17 is on the next page

	Additional Guidance	
17 cont	Up to M2 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts	
	Working may be in pence	
	Two correct comparable values found for 100g followed by incorrect units being stated such as 55p = 1kg and 52p = 1kg and B	M1M1A1
	Alt 1: If comparing, eg cost of 1g of each, there must be enough decimal places to enable a comparison to be made to award the A mark	
	Alt 1: Just repeating £1.10 and 200g or £2.60 and 500g	M0
	Alt 1: Once they have a value from either A or B they may choose to use a value from the difference between the packets for comparison. eg obtains 55p for 100g for packet A £1.50 for 300g (the difference between the two packs) 50p for 100g Packet B	 M1 M1 A1
	Some examples of commonly seen answers awarded M1M1A1: B and 55 and 52 (cost in p per 100g) B and 0.0055 and 0.0052 (cost in £s per 1g) B and 5.2 and 5.5 (cost of 1kg of each in £) B and 181.8 and 192.3 (mass per £1 for each) B and 2.75 (cost of 500g of bag A)	

Q	Answer	Mark	Comments
18(a)	1 : 8 or 0.125 : 1	B1	oe eg 0.25 : 2
	Additional Guidance		
	2 : 16		B1
	8 : 1		B0

Q	Answer	Mark	Comments
18(b)	1.2 (: 1)	B2	B1 $1.2a$ or $\frac{6}{5}$ or $1\frac{1}{5}$ or $6 \div 5$

Q	Answer	Mark	Comments
18(c)	2	B1	accept -2
	Additional Guidance		
	Accept a clear indication that x is 2 if the answer line is blank eg 1 : 2 = 2 : 4 in the working space		

Q	Answer	Mark	Comments
19(a)	$\frac{5}{8}$ on spinner 1 (green)	B1	oe fraction, decimal or percentage
	$\frac{4}{5}$ on spinner 2 (green) in both positions	B1	oe fractions, decimals or percentages
	Additional Guidance		
	Mark the diagram		
	A mix of fractions, decimals and percentages is acceptable		
	Percentages must have the % symbol		
	Accept 0.62 or 0.63 for 0.625 if decimals used		
	Accept 62% or 63% for 62.5% if percentages used		
	Spinner 1 **Spinner 2**  		B2

Q	Answer	Mark	Comments
19(b)	$\frac{3}{40}$ or 0.075 or 7.5%	B1	oe fraction, decimal or percentage
	Additional Guidance		
	Ignore attempt to simplify after a correct answer seen		

Q	Answer	Mark	Comments	
20(a)	All six given points plotted correctly and joined with straight lines	B2	± half square B1 at least four of the given points plotted correctly	
	Additional Guidance			
	Mark intention for straight lines			
	Lines can be dashed (do not regard as short lines if intention clear) or continuous			
	Ignore lines drawn to the left of day 1 and to the right of day 6			
	The top of the lines in a vertical line graph can imply points plotted correctly (other vertical lines can be ignored)			
	Ignore horizontal lines			
	Ignore extra points			
	Ignore a line of best fit and/or a histogram and/or a bar chart			

Q	Answer	Mark	Comments	
20(b)	[20 000, 40 000]	B1	may be implied	
	their [20 000, 40 000] × 0.018 (÷ 100) or [360, 720] (÷ 100)	M1	oe eg their [20 000, 40 000] × 0.000 18 1000 < their [20 000, 40 000] < 48 000 condone 0.02 for 0.018	
	[3.60, 7.20]	A1ft	ft B0M1 answer must be an amount of money	
	Additional Guidance			
	Accept an answer in pence only if £ has been crossed out and p(ence) is given			
	For A1 or A1ft accept answers rounded or truncated to the nearest penny eg 28 700 × 0.018 ÷ 100 Answer 5.17 (or 5.16)			B1M1A1
	Using 0.02 can score a maximum of B1M1A0 eg1 30 000 × 0.02 = 600 Answer 6 eg2 46 000 × 0.02 = 920 Answer 9.20			B1M1A0 B0M1A0
	Estimating their final answer can score a maximum of B1M1A0 unless correct answer also seen eg1 32 000 × 0.018 ÷ 100 Answer 5.80 eg2 32 000 × 0.018 ÷ 100 = 5.76 Answer 5.80			B1M1A0 B1M1A1
	30 000 × 0.018 Answer 5.4			B1M1A0
	If part (b) is blank, B1 may be awarded for [20 000, 40 000] unambiguously stated for day 7 in part (a)			

Q	Answer	Mark	Comments
21	Correct method for 40% of 70%	M1	eg 0.4×70 or 28 or 0.4×0.7 or $40\% \times 70\%$ or 0.28
	Correct method for 50% of $(100 - 70)\%$	M1	eg 0.5×30 or 15 or 0.5×0.3 or $50\% \times 30\%$ or 0.15 0.43 or $1 - 0.42 - 0.15$ or $100 - 42 - 15$ implies M2
	43	A1	SC2 57 SC1 0.57
	Additional Guidance		
	Up to M2 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Do not accept 'of' for '×' eg 40% of 70% with no further correct method		1st M0
	0.4×0.7 and $0.5 \times (1 - 0.7)$ may be seen embedded eg1 (200 discs) $0.4 \times 0.7 \times 200$ $0.5 \times 0.3 \times 200$ eg2 (d discs) $0.4 \times 0.7 \times d$ $0.5 \times 0.3 \times d$		M1 M1 M1 M1
	SC2 is for working out the percentage of discs that are not removed		

Q	Answer	Mark	Comments
22	48×16.25 or 780	M1	oe
	(927 – their 780) ÷ 24.5(0) or 147 ÷ 24.5(0) or 6	M1dep	oe eg $6 \times 24.5(0) = 147$ or $780 + 24.5 + 24.5 + 24.5 + 24.5 + 24.5 + 24.5 = 927$
	48 ÷ 5 or 9(.6) or 9r3	M1	oe eg adds 5s to at least 45
	15	A1	SC3 63 SC2 54 or 57
	Additional Guidance		
	Up to M3 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts		
	Note that the third mark is independent		
	Equivalent methods may be used following 780 and 9 in order to work out the number of paying adults eg $(780 + 9 \times 24.5 - 927) \div 24.5 + 3 = 6$		M1M1M1
	SC3 is the total number of people in the group SC2 is the total number of students plus either the free or paying adults		
	45 ÷ 5 = 9 implies 9 free adults		3rd M1

Q	Answer	Mark	Comments
23(a)	155 cm $\leqslant$ length $<$ 165 cm	B2	oe B1 155 or 165 in correct position SC1 165 cm $\leqslant$ length $<$ 155 cm
	Additional Guidance		
	Accept $164.\dot{9}$ for 165		
	Accept eg 155.0 for 155		

Q	Answer	Mark	Comments
23(b)	2.05 or $6.2 \div 3$ or $2.0\dot{6}$	M1	oe eg in cm
	2.05×3 and 6.15 or 205×3 and 6.15 or 205×3 and 615 and 620 or $2.0\dot{6}$ and 2.05 or $206.\dot{6}$ and 205	A1	accept eg $2.05 + 2.05 + 2.05$ for 2.05×3
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Accept rounding or truncating of $2.0\dot{6}$ or $206.\dot{6}$ to at least 4 sf Accept rounding or truncating of $2.0\dot{6}$ to 3 sf only if $6.2 \div 3$ is seen Accept rounding or truncating of $206.\dot{6}$ to 3 sf only if $620 \div 3$ is seen		
	Accept $2.04\dot{9}$ for 2.05		
	Ignore any reference to lower bounds		
	Ignore reference to units		
	2.05 or 205 may be embedded eg $2.05 + 2.06 + 2.09 = 6.2$ with no further work or explanation		M1A0
	$2.06 + 2.06 + 2.08 = 6.2$ with no further work or explanation $2.06 + 2.06 + 2.06 = 6.18$ with a clear reference to 2.05 and a full explanation		M0A0 M1A1

Q	Answer	Mark	Comments
24	$x + 5$	B1	

Q	Answer	Mark	Comments
25(a)	$20 \div \pi$ or [6.36, 6.37] or 6.4 or $20 \div 2\pi$ or [3.18, 3.185] or 3.2	M1	oe
	$\pi \times (20 \div 2\pi)^2 \times \frac{90}{360}$ or $\frac{100}{\pi} \times \frac{90}{360}$ or $\frac{25}{\pi}$	M1dep	oe full method
	[7.93, 7.97]	A1	
	Additional Guidance		
	Accept [3.14, 3.142] for π throughout		
	Ignore subsequent rounding after answer [7.93, 7.97] seen in working		

Q	Answer	Mark	Comments
25(b)	It is smaller than the answer to part (a)	B1	

Q	Answer	Mark	Comments
26	**Alternative method 1: uses or states tan**		
	tan stated or used	M1	implied by [0.726, 0.73] or [1.376, 1.4]
	$\tan 36 = \frac{x}{4}$ or $4 \times \tan 36$ or $\tan 54 = \frac{4}{x}$ or $\frac{4}{\tan 54}$	M1dep	oe accept [0.726, 0.73] for tan 36 accept [1.376, 1.4] for tan 54
	[2.9, 2.91] with M2 awarded	A1	accept 3 with M2 awarded
	Alternative method 2: works out hypotenuse first		
	(hypotenuse =) $\frac{4}{\sin 54}$ or $\frac{4}{\cos 36}$ or 4.9(…)	M1	oe accept [0.8, 0.81] for sin 54 or cos 36
	$\sqrt{(\text{their } 4.9(...))^2 - 4^2}$ or $\sqrt{[8, 8.45]}$ or their 4.9(…) × sin 36 or their 4.9(…) × cos 54	M1dep	oe
	[2.9, 2.91] with M2 awarded	A1	accept 3 with M2 awarded
	Additional Guidance		
	Alt 1 SOHCAHTOA with TOA selected (eg circled)		M1
	[2.9, 2.91] with no working		M0M0A0
	[2.9, 2.91] from accurate/scale drawing only		M0M0A0