GCSE

Applications of Mathematics (Linked Pair Pilot)

93701F
Unit 1: Foundation Tier
Mark scheme

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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 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

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.

M	Method marks are awarded for a correct method which could lead to a correct answer.
M dep	A method mark dependent on a previous method mark being awarded.
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.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
ft	Follow through marks. Marks awarded following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
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.

A1 Foundation Tier

Q	Answer	Mark	Comments
1(a)	Correct values and correct use of 5 bar gate	Q1	QWC strand (i)correct notation
	Archery 4, Biking 6, Horse riding 2, Karting 3	B1 ft	ft their tallies, or correct.
1(b)	Correct number of symbols for all 4 drawn.	B2 ft	Archery 2, Biking 3, Horse riding 1, Karting 1½ B1 for 3 correct.
1(c)	Biking	B1	
1(d)	$\dfrac{2}{15}$	B1	

Q	Answer	Mark	Comments
2(a)	**Alternative method 1**		
	580 × 12	M1	
	135 × 52	M1	
	6960 or 7020	A1	
	6960 and 7020 and House A	A1	
	Alternative method 2		
	580 × 12	M1	
	6960	A1	Implied by 133.8 seen
	their 6960 ÷ 52	M1	
	133(.8...) and House A	A1	
	Alternative method 3		
	52 ÷ 12	M1	
	4.33(3...)	A1	
	580 ÷ their 4.33(3 ...)	M1	
	[133.8, 133.95] and House A	A1	SC1 145 and House B
	Alternative method 4		
	52 ÷ 12	M1	
	4.33(3...)	A1	
	135 × their 4.33(3 ...)	M1	
	[584.5, 585] and House A	A1	SC1 540 and House B
	Alternative method 5		
	135 × 52	M1	
	7020	A1	
	their 7020 ÷ 12	M1	
	585 and House A	A1	

Q	Answer	Mark	Comments
2(b)	580 + 476.39	M1	
	1056.39	A1	
3(a)	100 + 12 × 55	M1	oe
	760	A1	
	their 760 - 650	M1	
	110	A1ft	ft their 760 if first method mark awarded
3(b)	Valid reason	B1	Less to pay up front, spreads the cost over a year.

Q	Answer	Mark	Comments
4(a)	9	B1	
4(b)	10	B1	
4(c)	2	B1	
4(d)	**Alternative method 1**		
	(Class 1 total =) 4 + 7 + 12 + 8 or 31	M1	Allow one error or omission
	(Class 2 total =) 6 + 5 + 9 or 20	M1	
	(Class 2 Grade C =) 11	A1	May be implied by correct height on graph.
	Rectangle drawn to their correct height	B1ft	ft their 11 Height $\pm$ ½ small square Width $\pm$ 1 small square Condone if not shaded.
	Alternative method 2		
	Attempt at all 3 differences 6 – 4, 5 – 7, 9 - 12	M1	(-)2, (+)2, (+)3, or (+)2, (-)2,(-)3 Allow one error.
	their 3 + 8	M1	
	11	A1	May be implied by correct height on graph.
	Rectangle drawn to their correct height	B1ft	ft their 11 Height $\pm$ ½ small square Width $\pm$ 1 small square Condone if not shaded.

Q	Answer	Mark	Comments
5	**Alternative method 1**		
	40 + 10 + 30 + 20 (=100)	M1	or 1 hour 40 min seen
	10.30 – their 1 hr 40 min	M1dep	
	8.50 (am)	A1	SC1 for 12.10 with no working
	Alternative method 2		
	10.00 or 10.10 or 9.50 or 10.20 seen	M1	Subtracting one of the times correctly
	Their value – the other 3 times	M1dep	Subtracting their other 3 times
	8.50 (am)	A1	SC1 for 12.10 with no working

Q	Answer	Mark	Comments
6(a)	$\dfrac{2}{100} \times 63500$ or 0.02×63500	M1	oe
	1270	A1	SC1 64770
6(b)	$\dfrac{780}{2}(\times 100)$ or 780 × 50 Or 1% is 390	M1	Oe eg $\dfrac{780}{0.02}$
	39 000	A1	SC1 figs 39 ...

Q	Answer	Mark	Comments
7(a)(i)	B	B1	
7(a)(ii)	C	B1	
7(a)(iii)	D	B1	
7(a)(iv)	A	B1	
7(b)	3 × 5 or 1 × 2 or 6 ×1 or 15	M1	Attempt at fx
	(3 × 5) + (1 × 2) + (6 ×1)	M1	Attempt at total frequency
	23 **and** Ben	A1	

	Answer	Mark	Comments
8(a)	5 (hours) seen	B1	
	their 5 × 6 + 8	M1	
	38	A1ft	ft their number of hours SC2: 44 with no working
8(b)	23.75 – 3 × 6	M1	oe
	5.75	A1	SC1 124.50

9	Paul has 42 stamps or Sandra has 58 stamps	B1	
	their 58 - their 42	M1	Must be at least one correct value and the other value must be in the correct range.
	16 (stamps)	A1	SC2 42 and 58 selected and not subtracted

10(a)	All leaves correct 10 | 3 7 11 | 2 4 8 12 | 0 2 3 5 13 | 1 1 4 9 14 | 6 7	B2	B1 3 rows correct or all correct values but unordered
	Aligned stem-and leaf-diagram with appropriate key	Q1	QWC strand ii
10(b)	123	B1	
10(c)	44	B1	
10(d)	Average scores/performance is the same.	B1 ft	oe ft their median for Jane
	Phil is more consistent Or Jane is less consistent	B1 ft	oe ft their range for Jane

Q	Answer	Mark	Comments
11(a)	$\dfrac{17650 - 10300}{4}$	M1	Must be at least one correct value
	1837.5(0)	A1	
	1840	B1ft	ft their 1837.5 rounded to nearest 10 SC2 15080 without working SC1 15075 without working
11(b)	=(A2-B2)/C2	B2	B1 if = sign omitted or brackets omitted.

Q	Answer	Mark	Comments
12	150 × 0.35 or 150 × 35 Or 150 × 0.35 + 20	M1	
	(£)52.5(0) or 5250p or (£)72.5(0)	A1	Answer in pence needs to show the units unless 52.5(0) is seen later in the question
	$\dfrac{4}{5} \times 150$ or 120	M1	oe
	their 120 ×1.4(0) or 168 or their 120 × 140 or 16800	M1dep	Dependent on previous M1
	(150 – their 120) ×(£)1 or (£) 30 used	M1	
	(their 168 +their 30) – their 52.5 (– 20) or (their 168 +their 30) – their 72.5	M1	Oe eg 198 – 72.5 Must be consistent units
	(£)125.50	A1	125.5 is A0

Q	Answer	Mark	Comments
13	1 2 4 4 or 1 3 5 5 or 2 3 5 5 or 1 4 6 6 or 2 4 6 6 or 3 4 6 6	B2	B1 a set of 4 numbers between 1 and 6 with a single mode Or a set of 4 numbers between 1 and 6 with median identified/calculated SC1 for 1 1 3 3 or 2 2 4 4 or 3 3 5 5 or 4 4 6 6 or 1 1 1 1 or 2 2 2 2 etc (up to 6 6 6 6)

Q	Answer	Mark	Comments
14	**Alternative method 1**		
	500 × 10 or 5000	M1	
	their 5000 ÷ 1500	M1	or repeated addition of 1500 (at least 3) Allow their 5000 from 500 × 10 or 500 × 11
	$3\frac{1}{3}$ or 3.3(..)	A1	4500 or 6000 $3\frac{1}{3}$ or 3.3(..)can be implied by an an answer of 4 from correct working
	4 (bottles)	B1 ft	ft their fraction or decimal answer rounded up to nearest integer. SC2 for 4 with no working or unsupported
	Alternative method 2		
	1500 ÷ 10 or 150	M1	1 bottle of water is enough for 150ml apple juice
	500 ÷ their 150	M1	or repeated addition of 150 (at least 3) Allow their 150 from 1500 ÷ 10 or 1500 ÷ 11
	$3\frac{1}{3}$ or 3.3(..)	A1	450 or 600 $3\frac{1}{3}$ or 3.3(..)can be implied by an an answer of 4 from correct working
	4 (bottles)	B1 ft	ft their fraction or decimal answer rounded up to nearest integer. SC2 for 4 with no working or unsupported

Q	Answer	Mark	Comments
15(a)	(£) $10 - 6x$	B1	Condone equation eg C=$10 - 6x$ or change =$10 - 6x$
15(b)	**Alternative method 1**		
	$10 - 4x = 2$ their$(10 - 6x)$	M1	ft their 15(a) if linear
	$10 - 4x = 20 - 12x$	M1	or $5 - 2x = 10 - 6x$ expanding their bracket or dividing through by 2 ft their equation
	$8x = 10$ or $4x = 5$	M1	collecting like terms ft their equation if x on both sides
	1.25	A1ft	ft their 15(a) if linear
	Alternative method 2		
	c =$10 - 6x$ **and** 2c=$10 - 4x$	M1	ft their 15(a) if linear Allow any letter except x for c
	$2c = 20 - 12x$ (and 2c=$10 - 4x$)	M1	Or c =$10 - 6x$ and c=$5 - 2x$
	$0 = 10 - 8x$ or $8x = 10$	M1	Or $0 = 5 - 4x$ or $4x = 5$
	1.25	A1	
	Alternative method 3		
	Trial of any price <(£)10 for both Mary and Ben with change calculated	M1	
	Trial of a second price <(£)10 for both Mary and Ben with change calculated	M1	If 1.25 is used as the first trial then a second trial is not required
	1.25	A1	**Note** 3 marks only for a numerical method

Q	Answer	Mark	Comments
16	0.269 × 54 or 0.143 ×86	M1	
	14.(526)	A1	Allow use of a consistent number of washing machines and cookers
	12.(298)	A1	Eg risk of cover for 1000 of each
			14526 and 12298 gains A2
			If number of units is not stated Q0
	Washing machine	Q1ft	ft their 14.(526) and their 12(.298) if M1 awarded
			Organised response and conclusion made.