General Certificate of Secondary Education
June 2012

Mathematics (Linear) B   4365
Paper 2
Foundation Tier

Final

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the students' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal 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.

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 which is 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.
Q	This mark is for quality of written communication. Further details of how to apply it will be in the mark scheme.
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.

Q	Answer	Mark	Comments
1(a)	4	B1	

Q	Answer	Mark	Comments
1(b)	5 (+) 3.5 (+) 6 (+) 1.5 or 16 seen or one of 3.5 × (a), 6 × (a) or 1.5 × (a) or any number × their (a)	M1	oe
	their 16 × their 4 or 20 + their 11 × their 4 or (their) 20 + their 14 + their 24 + their 6	M1dep	oe
	64	A1 ft	Unless key = 1 ft their key × 16 or ft 20 + their key × 11

Q	Answer	Mark	Comments
2(a)	12 + 9.99 + 9.99	M1	oe
	31.98	A1	

Q	Answer	Mark	Comments
2(b)	12 + 14.5(0) or 26.5(0) or 50 − 12 or 38 or 50 − 14.5(0) or 35.5(0)	M1	
	50 − (12 + 14.5(0)) or 50 – their 26.5(0) or their 38 – 14.5(0) or their 35.5(0) – 12	M1dep	oe
	23.50	A1	23.5 implies M1M1A0

Q	Answer	Mark	Comments	
2(c)	$9.70 + \dfrac{9.70}{2}$ or 9.70 + 4.85 oe or 9.7 × 1.5	M1	14.50 – 9.70 (= 4.80) and 9.70 ÷ 2 (4.85)	9.70 ÷ 2 (= 4.85) and 14.50 – their 4.85 (= 9.65)
	14.55 and no oe	A1	4.80 and 4.85 and No	(4.85 and) 9.65 and No

Q	Answer	Mark	Comments
3	Likely	B1	
	Impossible	B1	
	Unlikely	B1	

Q	Answer	Mark	Comments
4	3, 3, 4, 4, 2	B3	B2 for two criteria met eg 3, 3, 3, 4, 4 B1 for one criteria met eg 3, 3, 4, 4, 4

Q	Answer	Mark	Comments
5	7488	B1	

Q	Answer	Mark	Comments
6(a)	50 (%)	B1	

Q	Answer	Mark	Comments
6(b)	$\dfrac{1}{4}$	B2	B1 $\dfrac{4}{16}$ oe B1 wrong fraction correctly simplified

Q	Answer	Mark	Comments
6(c)	Shade the equivalent of 2 squares	B1	

Q	Answer	Mark	Comments
7(a)	285 ÷ 95	M1	oe eg 95 + 95 + 95 = 285
	3	A1	

Q	Answer	Mark	Comments
7(b)	£2, 50p, 10p, 10p, 10p, 5p	B1	If no B marks are awarded, SC1 for any number of coins with a total of £2.85 which may include £1 coin
	£2, 50p, 20p, 5p, 5p, 5p	B1	
	£2, 20p, 20p, 20p, 20p, 5p	B1	

Q	Answer	Mark	Comments
8	1.5 (cm) or 6 (cm) seen or scale factor = 4 (can be indicated on diagram)	B1	Accept [1.4, 1.6] Accept [5.9, 6.1] Accept [3.6, 4.4]
	2 × their 6 ÷ their 1.5 oe or 2 × their [3.6, 4.4]	M1	
	8	A1	Accept [7.2, 8.8]

9(a)	240	B1	

9(b)	70 × 3	M1	
	210	A1	
	30	B1ft	ft their 240 – their 210 provided gives +ve answer

Q	Answer	Mark	Comments
9(c)	$\frac{80}{100}$ × 90 or 72 (from M) or $\frac{20}{100}$ × 90 or 18 (from B) or 80(%) – 50(%) or 50(%) – 20(%) or 30 %	M1	oe
	90 ÷ 2 or 45 seen or their 30% of 90	M1	oe
	their 45 – their 18 or their 72 – their 45 or $\frac{30}{100}$ × 90	M1dep	oe Dep on one M awarded
	27	A1	

10(a)	46.9148(1642...)	B1	

10(b)	50	B1ft	ft their (a) to the nearest 10

Q	Answer	Mark	Comments
11(a)	*A* and *C* in any order	B2	B1 for 1 correct (and 1 incorrect)
11(b)	*C*	B1	

11(c)		B1	

12(a)	132	B1	

| 12(b) | 360 – (142 + 115) | M1 | oe |
| | 103 | A1 | |

13	100 grams	B1	
	2 litres	B1	
	5 metres	B1	

14(a)	6	B1	

14(b)	60	B1	

| 14(c) | $(2y =)$ 12 + 5   or   17 | M1 | |
| | $\frac{17}{2}$ or $8\frac{1}{2}$ or 8.5 | A1 | |

| 15(a) | 5×6.2 | M1 | |
| | 31 | A1 | |

Q	Answer	Mark	Comments
15(b)	$x + 3x + 5x + 5x$ or $14x$	M1	$7\ (+)\ 3 \times 7\ (+)\ 5 \times 7\ (+)\ 5 \times 7$ oe
	their 14×7	M1dep	oe $7 + 3 \times 7 + 5 \times 7 + 5 \times 7$ or $7 + 21 + 35 + 35$
	98	A1	

16(a)	9	B1	

16(b)	7.4	B1	

16(c)	2.6	B1	

16(d)	Footballers slower or athletes faster	B1ft	Strict follow through from their (b) and (c)
	Footballers less consistent or athletes more consistent	B1ft	Strict follow through from their (b) and (c)

17	7.2 + 6 or 13.2	M1	$4x - 6 = 7.2$
	their $13.2 \div 4$	M1dep	$4x = 7.2 + 6$ or $x - \frac{6}{4} = \frac{7.2}{4}$
	3.3	A1	SC2 for 52.8 or 0.3 or 8.7 SC1 for 4.8

18	Lists at least 4 different combinations or $\frac{1}{2}$ or $\frac{1}{4}$ seen	M1	1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D
	Lists all 8 combinations or 2×4 or 8 seen or $\frac{1}{2} \times \frac{1}{4}$	M1dep	Seen or implied eg 8 lines drawn from numbers to letters on diagram eg 1→A, 1→B etc
	$\frac{1}{8}$	A1	oe

Q	Answer	Mark	Comments
19	169 ÷ 65	M1	65 × 2.5 or 65 × their 2.5 or 169 ÷ 2.5
	2.6 or 2 hours 36 (minutes)	A1	162.5 or 6.5 miles to go or 67.6 (mph)
	2h 30 or 2.5 h or 150 (minutes) or 9.06 or 9.1 (not 9.10) or 6.24 or 6.4	B1	2.5h
	No	A1	

Q	Answer	Mark	Comments
20(a)	10 × 78 or 780 or 78 ÷ 3 or 26	M1	or 10 × 44 or 440
	10 × 78 ÷ 3 or 260 or 78 ÷ 3 × 2	M1	
	520 or 52	A1	
	0.15 × 600 or 15 × 600 (÷ 100) or $\frac{600 \times 0.15}{10}$ or $\frac{600 \times 15}{10}$ or 900	M1	
	53 or 530	A1	
	520 and 530 and Hire Deal or 52 and 53 and Hire Deal	A1ft	from 3 method marks awarded and consistent answers

Q	Answer	Mark	Comments
20(b)	15 (×) (3 × 13 + 8) or 15 × 47	M1	15 × 3 × 13 + 15 × 8 or 15 × 39 + 15 × 8 45 × 13 + 15 × 8 or 585 + 120 oe
	(£) 705	A1	

Q	Answer		Mark	Comments
21(a)	147		B1	May be seen on diagram
	Corresponding		Q1	oe eg (y is) alternate and x is opposite Check part (b) Strand (i)

Q	Answer		Mark	Comments
21(b)	147		B1 ft	May be seen on diagram ft their (a)
	Alternate or (vertically) opposite		Q1	oe eg x is corresponding and y is opposite Strand (i)

Q	Answer		Mark	Comments	
22	380 + 400 + 420 or 1200 seen		M1		
	28 + 32 + 36 or 96 seen		M1	352 + 368 + 384 or 1104 seen	
	$\frac{7}{100} \times 1200$	$\frac{96}{1200} \times 100$ (%)	M1	$\frac{93}{100} \times 1200$	$\frac{1104}{1200} \times 100$(%)
	84	8 (%)	A1	1116	92 (%)
	84 < 96	8(%) > 7 (%)	Q1 ft	1104 < 1116	92 (%) (< 93 (%))
	and No			**and** No	
				Strand (iii) for calculating 93%, 7% of total number of pupils and correct comparison with total number of present, absent; or working out $\frac{\text{total present}/\text{absent}}{\text{total of whole school}} \times 100$(%) and correct comparison with total of school	

Q	Answer	Mark	Comments

This Alt mark scheme has been provided even though it is only correct for the numbers in the question. Change of numbers may render it incorrect.

Q	Answer		Mark	Comments
Alt 22	380 – 28 or 352 or 400 – 32 or 368 or 420 – 36 or 384		M1	100(%) – 93(%) or 7(%)
	$\frac{\text{their } 352}{380} \times 100(\%)$ or $\frac{\text{their } 368}{400} \times 100(\%)$ or $\frac{\text{their } 384}{420} \times 100(\%)$	$\frac{93}{100} \times 380$ or $\frac{93}{100} \times 400$ or $\frac{93}{100} \times 420$	M1	$\frac{28}{380} \times 100(\%)$ or $\frac{32}{400} \times 100(\%)$ or $\frac{36}{420} \times 100(\%)$
	92.6(...)(%) or 92(%) or 91.4(...)(%)	353.4 or 372 or 390.6	A1	7.3(...)(%) or 7.4(%) or 8(%) or 8.5(...)(%) or 8.6(%)
	92.6(...) (%) and 92 (%) and 91.4(...) (%)	353.4 and 372 and 390.6	A1	7.3(...)(%) or 7.4(%) and 8(%) and 8.5(...)(%) or 8.6(%)
	All numbers are below 93(%) and no	353.4 > 352 and 372 > 368 and 390.6 > 384 and no	Q1ft	All numbers are above 7(%) and no

Q	Answer	Mark	Comments
23	Correct trial such that root < trial $\leqslant$ 5	M1	eg $4^3 - 3 \times 4 = 52$ (too big) Obtains $3 < x \leqslant 5$ or better (need not be stated)
	Improved correct trial	M1	$3 <$ trial $< 1^{st}$ trial or $3 <$ trial $<$ root eg $3.5^3 - 3 \times 3.5 = 32.(3\ldots)$ or 32.4 (too small)
	Obtains $3.8 \leqslant x \leqslant 3.9$ or better	A1	$3.6 \rightarrow 35.(8\ldots)$ or 35.9 $3.7 \rightarrow 39.(5\ldots)$ or 39.6 $3.8 \rightarrow 43.(4\ldots)$ or 43.5 $3.9 \rightarrow 47.(6\ldots)$
	Tests 3.85 (or 3.84) and concludes 3.8	Q1	$3.85 \rightarrow 45.5(16625)$ $3.84 \rightarrow 45.1(03104)$ Using 2 dp to ensure 1 dp Strand (ii)

Q	Answer	Mark	Comments
24	$(AC^2 =)\ 23^2 + 31^2\ (=1490)$	M1	
	$\sqrt{23^2 + 31^2}$ or $\sqrt{\text{their }1490}$	M1 dep	
	$38.6(...)$ or 39	A1	

Q	Answer	Mark	Comments
25	Suitable question with time frame	B1	
	Suitable response section	B1	No gaps, no overlap and final category open-ended

Q	Answer	Mark	Comments
26(a)	$3x \geqslant 16 + 5$ or $3x \geqslant 21$	M1	oe $x \geqslant \dfrac{21}{3}$
	$x \geqslant 7$	A1	oe

Q	Answer	Mark	Comments
26(b)	$-2 \leqslant 2y \leqslant 6$	B1	

Q	Answer	Mark	Comments
27	Correct heights plotted or shown	B1	
	Fully correct frequency polygon	B1	Midpoints used and straight lines intended to join them Allow midpoints to be at [24.5, 26] [34.5, 36] etc SC1 for one height plotted incorrectly but midpoints used in an otherwise correct frequency polygon