General Certificate of Secondary Education
January 2013

Mathematics (Linear) B **4365**
Paper 1
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 candidates' 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 candidates' 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 candidates' 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.

Set and published by the Assessment and Qualifications Alliance.

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.
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.
Q	Marks awarded for quality of written communication.
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.
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.
oe	Or equivalent. Accept answers that are equivalent. e.g. accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.
25.3 …	Allow answers which begin 25.3 e.g. 25.3, 25.31, 25.378.
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Paper 1 Foundation Tier

Q	Answer	Mark	Comments
1(a)	(0)3 05, 15 05, 5 past 3	B1	oe Ignore any reference to am or pm
1(b)	Acute	B1	
1(c)	12 25	B3	B2 for answer of 11 25 or 12 40 Or (0)9 10 + 3 x 60 + 15 oe B1 for 10 10 or 11 10 or 12 10 seen or (0)9 25 or 10 25 seen or 3 x 60 + 15 oe All times are oe
2(a)	27	B1	
2(b)	10	B1	
2(c)	16	B1	
2(d)	13	B1	

Q	Answer	Mark	Comments
3	3×65 or 195(p) or (£)1.95 or 3×110 or 330(p) or (£)3.30	M1	$65 + 110$ or 175(p) or (£)1.75
	Adds all six items their (3×65) + their (3×110)	M1dep	$3 \times$ their $(65 + 110)$
	No **and** (£)5.25 or 525p	A1	oe eg She will be 25p short
3 **Alt**	(£)5 – at least two items eg (£)5 – 220	M1	
	Adds up the rest of the six items	M1dep	
	No **and** correct amount of money left **and** correct cost of remaining items	A1	oe eg No **and** (£)1.70 **and** (£)1.95 or No **and** (£)3.05 **and** (£)3.30
4(a)	9	B1	Ignore working which may be for 4(b)
4(b)	5 7 (9) 9 10	B1	Numbers arranged in ascending or descending order **and** a clear indication that 9 is the middle number **or** A clear and complete statement that 9 is the middle number when you arrange them in order

Cost of items		S			
		0	**1**	**2**	**3**
D	**0**			220	330
	1		175	285	395
	2	130	240	350	460
	3	195	305	415	**525**

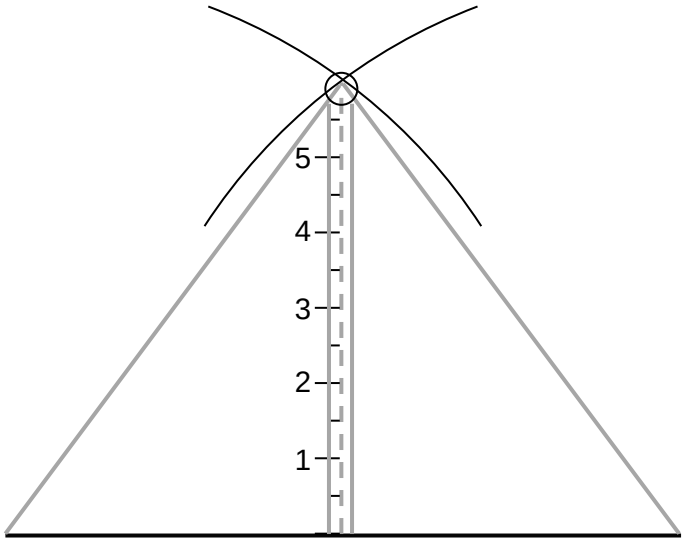
Q	Answer	Mark	Comments
5	T, T, F, T	B3	B2 for 3 correct B1 for 2 correct
6(a)	F	B1	
	Square	B1	
6(b)	9	B1	
	cm^2	B1	
7(a)	Bar of height 4 labelled Coffee or C **and** Bar of height 5 labelled Juice or J (in either order but with a gap of 1 square between all bars)	B2	B1 for one of the bars labelled and correct or B1 for diagram fully correct but missing or incorrect label(s) or B1 for diagram fully correct but no gaps or incorrect gaps
7(b)	7 (boys)	B1	
	their 7 – 4	M1	Subtraction may be implied by correct ft answer of their 7 – 4
	3	A1ft	ft B0M1 but must be integer answer for A1
8(a)	15	B1	
8(b)	30 ÷ 6 (= 5) or 30 ÷ 3 or (15 –) $\frac{15}{3}$ or 15 ÷ 3 (× 2)	M1	oe eg 360 ÷ 30 (= 12) and (180 – 60) ÷ their 12 eg 180 – 60 (= 120) and $\frac{\text{their } 120}{360} \times 30$ may be using their (a) for 15 (but not an angle)
	10	A1ft	ft their (a) – 5 or their (a) ÷ 3 × 2 but must be integer answer for A1

Q	Answer	Mark	Comments
*9	**Decimals**		
	($\frac{1}{10}$ =) 0.1 **or** (11%=) 0.11	M1	
	($\frac{1}{10}$ =) 0.1 **and** (11%=) 0.11	A1	oe
	Converting 1/10 and 11% to decimals with at least one right and arranging in correct ft order for **their** decimals	Q1	Strand (ii) SC1 for $\frac{1}{10}$, 11%, 0.2 with no working
*9 Alt 1	**Percentages**		
	($\frac{1}{10}$ =) 10(%) **or** (0.2 =) 20(%)	M1	
	($\frac{1}{10}$ =) 10(%) **and** (0.2 =) 20(%)	A1	oe
	Converting 1/10 and 0.2 to percentages (both with percentage signs) with at least one right and arranging in correct ft order for **their** percentages	Q1	Strand (ii) SC1 for $\frac{1}{10}$, 11%, 0.2 with no working
*9 Alt 2	**Fractions**		
	(0.2 =) $\frac{2}{10}$ **or** (11% =) $\frac{11}{100}$	M1	oe fraction
	$\frac{10}{100}$ **and** $\frac{20}{100}$ **and** $\frac{11}{100}$	A1	oe three correct fractions with common denominator
	Converting all numbers to fractions with a common denominator with at least one numerator right and arranging in correct ft order for **their** fractions	Q1	Strand (ii) SC1 for $\frac{1}{10}$, 11%, 0.2 with no working

Q	Answer	Mark	Comments
10(a)	54.32	B1	
10(b)	**Listing the positions of hurdles**		
	Listing at least 3 ‘hurdles’ eg 45, 80, 115, ... or 35, 70, 105, ... or 85, 120, 155, ... or 355, 320, 285, ...	M1	oe Condone 1 error
	Complete list eg 45, 80, 115, 150, 185, 220, 255, 290, 325, 360, (400) or 85, 120, 155, 190, 225, 260, 295, 330, 365, (400) or 400, 355, 320, 285, 250, 215, 180, 145, 110, 75, 40, (0)	M1dep	oe Ascending or descending with max 1 error (may be more if cumulative)
	10	A1	SC1 for 10 with M0M0
10(b) Alt 1	**Adding consecutive distances**		
	Adds at least 3 consecutive distances 45 + 35 + 35 + ... or 35 + 35 + 35 +... or ... + 35 + 35 + 40	M1	oe eg 45 + 70 + ...
	Complete method shown with 9 lots of 35 ie 45 + 35 + 35 + 35 + 35 + 35 + 35 + 35 + 35 + 40 with total in range (370, 430)	M1dep	oe
	10	A1	SC1 for 10 with M0M0
10(b) Alt 2	400 – (45 + 40) (= 315)	M1	
	their 315 ÷ 35 or 35 × 9 = 315	M1dep	315, 280, 245, 210, 175, 140, 105, 70, 35, (0) in either order and allow 1 error (may be more if cumulative)
	10	A1	SC1 for 10 with M0M0

Q	Answer	Mark	Comments
11	2×11 **and** 3×5 or 22 or 15	M1	oe
	37	A1	
***12**	$\frac{10}{100} \times 200$ oe or 20 seen	M1	$\frac{90}{100} \times 200$ oe or 180 is M2
	200 – their 20 or 180 seen	M1dep	
	6	A1	
	Method shown for 90% of 200 and dividing their result by 30	Q1	Strand (iii)
***12 Alt**	$\frac{200}{30}$ or $\frac{20}{3}$	M1	oe
	$\frac{10}{100} \times$ their $\frac{200}{30}$ or $\frac{2}{3}$	M1dep	oe
	6	A1	
	Method shown for dividing by 30 and finding 90% of their result	Q1	Strand (iii)

Q	Answer	Mark	Comments
13	3	B2	B1 for 8 seen as value of X for Set A or 3 seen as value of X for set A but different value for set B
14	27	B1	
	81	B1ft	ft their 27 × 3 Answers must be evaluated
15(a)	75	B1	
15(b)	(27 – 5) ÷ 2	M1	Condone omission of brackets
	11	A1	
	3	B1ft	ft (their 11 – 5) ÷ 2 if A0 awarded SC1 for 0.75 SC1 for 24.5 **and** 22
15(b) Alt 1	$2x + 5 = 27$	M1	
	11 or $2(2x + 5) + 5 = 27$ oe or (27 – 15) ÷ 4	A1	
	3	A1	
15(b) Alt 2	Two fully correct trials eg any two of $u_1 = 1, u_2 = 7, u_3 = 19$ $u_1 = 2, u_2 = 9, u_3 = 23$ $u_1 = 4, u_2 = 13, u_3 = 31$ $u_1 = 5, u_2 = 15, u_3 = 35$	M1	
	Fully correct trial with first term 3 ie $u_1 = 3, u_2 = 11, u_3 = 27$	M1dep	
	3	A1	

Q	Answer	Mark	Comments
16	Isosceles triangle with base on 9 cm line and vertex within 2 mm (ie in the circle on the overlay)	B2	B1 for any isosceles triangle on the base with vertex within 2 mm of centre line or B1 for any side 7.5 cm long ± 2 mm or any arc 7.5 cm drawn ± 2 mm or 7.5 (cm) seen
	No **and** 1.2 (m) or 120 (cm) or No **and** 6 (cm) **and** 6.4 (cm)	B1ft	ft the vertical height of their triangle Jack's height accurately drawn ± 2 mm on diagram and a decision stated or Vertical height of their triangle may be stated and compared to Jack's scale height ie [6.2, 6.6]
			

Q	Answer	Mark	Comments
17(a)	Line from (08 00, 0) to (09 30, 60)	B1	Line need not be straight ± 1 small square
	1 cm horizontal line from their (09 30, 60) **or** horizontal line ending at 10 00	B1ft	± 1 small square
	Line from (10 00, 60) to meet the time axis between (11 06, 0) and (11 18, 0) inclusive **or** line from their (10 00, 60) down 6 cm and across 2.4 cm oe	B1ft	Line need not be straight ± 1 small square
17(b)	Correct ft decision and reference to their graph **or** correct ft decision and correct ft time (±6 minutes) read from their graph	B1ft	Must be from a line that meets the time axis at least 6 mins after their 10 00
17(b) Alt	Correct ft decision and calculation of home time eg 60 miles at 50 mph = 1.2 hours 11 30 is 1.5 hours after 10 or 10 + 1.2 hours = 11 12	B1ft	ft from their 10 00

Q	Answer	Mark	Comments
18	<table><tr><td>**4**</td><td>**12**</td><td>**10**</td></tr><tr><td>**15**</td><td>5</td><td>6</td></tr></table>	B3	B2 for 12 and/or 10 in correct position **and** any product that makes 60 in first column (not using 5 or 6) B1 for 12 and/or 10 in correct position **or** any product that makes 60 in first column (not using 5 or 6)
19	Kite either horizontal or vertical with long diagonal 6 cm and short diagonal 4 cm	B2	B1 for any kite Condone a square using the given side or an arrowhead for B1
20	$4n$	M1	Accept $4 \times n$ or $n \times 4$ but not $n4$
	$4n + 2$	A1	oe eg $4 \times n + 2$ $3n + n + 2$ $2(2n + 1)$ SC1 for $n4 + 2$

Q	Answer	Mark	Comments
***21a**	Open circle at –2 with line going right to at least 4 or arrow (of any length) to the right	Q1	Strand (i) If line is marked with any sort of circle at the RHS this is Q0
21b	$3x \leq 11 - 5$ or $3x \leq 6$ or $x - 2 \leq 0$	M1	Working with = sign must be recovered to ≤ to gain any credit
	$x \leq 2$	A1	Must have $x \leq$ on answer line SC1 for $x < 2$
22	$\pi \times 10^2 \times 4$	M1	
	$\pi \times 100 \times 4$ or $3.1 \times 100 \times 4$ or 31×40 or 124×10	A1	Any of these products or better Condone use of 3.14 or 3.142 or $\frac{22}{7}$
	1240	A1	Accept 1256 or 1256.8 or 1257.(...) or 1260