General Certificate of Secondary Education
June 2012

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 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.

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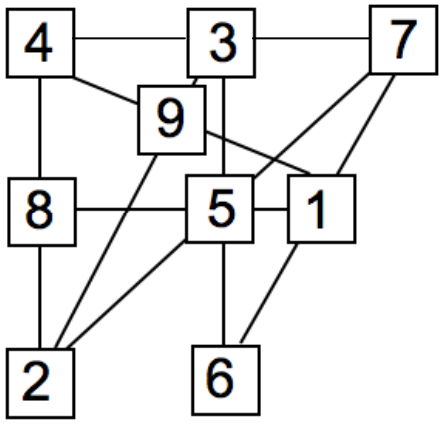
Glossary for Mark Schemes

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.

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.
Q	A mark that can be awarded for quality of written communication
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. e.g., accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.

Q	Answer	Mark	Comments
1(a)	(1, 3)	B1	
1(b)	Plot at (5, 3) or lines drawn to form rectangle	B1	letter D need not be seen
1(c)	3 + 4 (= 7)	M1	oe ± 1 mm for each length
	14	A1	
2(a)	10	B1	Allow in words
2(b)	10 and 6 chosen	B1	
	their 10 × 1.20 (+) their 6 (× 1)	M1	(£)12 (+) (£)6 implies B1M1
	18	A1ft	ft from B0M1 only SC2 17.20 SC1 17.2
2(c)	10 + 8 + 7 + 12 + 7 + 6	M1	Allow 1 misread
	50	A1	(£)50 seen implies M1A1
	States that 100 = 2 × 50 or that 50 is half of 100 and yes	Q1dep	Strand (iii) Dep on M1 Allow conclusion based on a value ≠ 50 as long as 'approx. double' or 'about half' or 'No' and some working is stated
3(a)	185	B1	
3(b)	144	B1	
4		B3	B2 for 2 lines with a total of 14 B1 for any line with a total of 14
5	3 × 2 (+) 5 × 7	M1	
	41	A1	

Q	Answer	Mark	Comments
6(a)	10	B1	
6(b)	169	B1	
7(a)	30 × 8 **or** 4 × 8	M1	240 **or** 32
	272	A1	If M1 not awarded allow SC1 for 272
	30 × 8 + 4 × 8 seen	Q1	Strand (ii) Addition may be implied (possibly by correct total)
7(b)	4032 ÷ 8	M1	May be implied by digits of 5, 4 in answer
	504	A1	
7(b) Alt	4032 ÷ 2 ÷ 2 ÷ 2	M1	
	504	A1	
8	0.8 × 300	M1	oe eg Complete build-up
	240	A1	SC1 Answer 60
9(a)	27	B1	
9(b)	31	B1	
9(c)	25 or 45	B1	Allow both
10(a)	15:02	B1	oe
10(b)	Their 15:02 – 10:15	M1	Any valid complete method eg 45 m + 4 h + 2 m
	4 h 47(m) or 287 minutes	A1ft	ft their answer from 10(a) SC1 4h 43m or 283 min **but** may score 2 marks if ft from 14:58 in (a)

Q	Answer	Mark	Comments
10(c)	17:57 – 16:24 (= 1:33)	M1	
	Yes and 1:33	A1	oe
10(c) Alt 1	16:24 + 1:30 (= 17:54)	M1	Condone 16:24 + 90
	Yes and 17:54	A1	oe
10(c) Alt 2	17:57 – 1:30 (= 16:27)	M1	Condone 17:57 – 90
	Yes and 16:27 and 16:24	A1	oe
11(a)	C	B1	Accept 80
11(b)	B	B1	Accept 22
11(c)	C	B1	Accept 30
12(a)	4×2 or $6 \times 4 – (4 \times 4)$ or $4 \times 4 \div 2$	M1	
	8	A1	SC1 Shows shaded rectangle is 4 by 2 on diagram or SC1 Shows large rectangle is 6 by 4 on diagram (6 could be 1, 4, 1)
12(b)	3.5 or 7 seen	B1	
	$4 \times$ their 3.5 + $4 \times 4 + 4$ ($\times 1$)	M1	oe eg $2 \times$ their $7 + 4 \times 4 + 4$ ($\times 1$) Condone including 3 or 4 internal edges
	34	A1ft	ft their 3.5 No extra edges
13(a)	[2.7, 2.9]	B1	
13(b)	Any factor of 100 read correctly **from graph**	M1	e.g. (10, 0.7), (20, 1.4), (25, 1.75) ± 0.1 for reading
	Their value multiplied by the appropriate complementary factor	M1	Appropriate number of repeated additions
	7	A1ft	ft their reading if M2 scored
13(b) Alt	40 + 40 + 20 or 2.5 seen	M1	
	Their (a) $\times$ 2.5	M1	oe
	7	A1ft	ft their (a) if M2 scored

Q	Answer	Mark	Comments
14(a)	$3x - 18$	B1	
14(b)	$5(y - 2)$	B1	
14(c)	$12w + 3 - 15w + 10$ $(12w + 3) - (15w - 10)$	M1	Allow one sign or arithmetic error for M1
	$12w + 3 - 15w + 10$	A1	A1 if all correct
	$-3w + 13$	A1ft	ft their expansion if M awarded Ignore any non-contradictory further work, such as solving an equation, but do not award A1 if contradictory further work, such as = $10w$
15(a)	Points plotted correctly	B2	B1 if 4 or 5 plotted correctly $\pm \frac{1}{2}$ small square
15(b)	Mark or LOBF on graph within range (25, 40) to (25, 44)	M1	
	40 – 44	A1ft	ft their line or their mark SC1 if no marks or no LOBF shown and answer in range [40, 44]
15(b) Alt	Any attempt at interpolation or 'build up'	M1	Shows sales **and** temperature for two points either side of 25, eg one of (20, 36) or (21, 37) or (22, 39) and (29, 47) or a calculation such as $39 + 3 \times (47 - 39) \div 7$
	40 – 44	A1ft	SC1 if the 'interpolation' is not convincing but answer in range [40, 44]
15(c)	No as the sales at low temperatures are constant No as at 9° sales are (about) same	B1	At low temperatures sales do not increase
16(a)	Pearl or 1.7	B1	
16(b)	$\frac{3}{5}$	B1	oe
16(c)	5×58 (= 290) + 64 (= 354)	M1	(64 – 58) ÷ 6 (= 1)
	Their 354 ÷ 6	M1dep	58 + their 1 NB $\frac{58 \times 5}{6} + \frac{64}{6}$ is M2
	59	A1	SC1 1.645 for mean of six heights

Q	Answer	Mark	Comments
17	Radius = 3 [2.9, 3.1] or diameter = 6 [5.9 to 6.1]	B1	Radius = 30 [29, 31] or diameter = 60 [59, 61]
	$\pi \times$ (their radius)^2 or $\pi \times (\frac{1}{2}$ their diameter)^2 or $\pi \times$ (any length but 6 if no diameter or radius seen)^2	M1	
	9π or $\pi 9$ or $9 \times \pi$ or $\pi \times 9$ or $\frac{198}{7}$ or answer in range [27.9, 28.3]	A1	900π or $\pi 900$ or $900 \times \pi$ or $\pi \times 900$ or answer in range [2790, 2830] SC1 if only 3, 6, 30 or 60 seen
	cm^2	B1	mm^2 Accept units if seen in working but not stated on answer line
18	$1 \times x$ **or** $3 \times (x + 2)$ **or** $1 \times (3 + x)$ **or** $3 \times (x + 1)$	M1	Shows the area of any appropriate rectangle Allow invisible brackets
	$x + 3(x + 2)$ **or** $(3 + x) + 3(x + 1)$	M1dep	Allow invisible brackets
	$x + 3x + 6 = 12$ **or** $3 + x + 3x + 3 = 12$	M1dep	oe eg $4x + 6 = 12$ Invisible brackets expanded correctly
	1.5	A1	oe
18 Alt 1	$(x + 2)(x + 3)$ **or** $x(x + 1)$	M1	Allow invisible brackets
	$(x + 2)(x + 3) - x(x + 1)$	M1dep	Allow invisible brackets
	$x^2 + 2x + 3x + 6 - x^2 - x = 12$	M1dep	oe Invisible brackets must be expanded correctly
	1.5	A1	oe eg $\frac{6}{4}$
18 Alt 2	Guess a value for x and correctly works out area below $12\,cm^2$	M1	eg $x = 1$ gives $(1 + 9) = 10$ or $(4 + 6) = 10$ $x = 0.5$ gives 8
	Guess a value for x and correctly works out area above $12\,cm^2$	M1	eg $x = 2$ gives $(2 + 12) = 14$ or $(5 + 9) = 14$ $x = 2.5$ gives 16, $x = 3$ gives 18, $x = 3.5$ gives 20
	Tries a value between 1 and 2 and correctly works out area	M1dep	
	1.5	A1	oe SC2 3×3.5 and 1×1.5 seen **or** 3×2.5 and 1×4.5 seen