General Certificate of Secondary Education
November 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 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.

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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	Marks awarded for quality of written communication. (QWC)
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.

Paper 2 Foundation Tier

Q	Answer	Mark	Comments
1	Attempt to count shaded squares or 5×2 (+ 3) or 3×3 (+ 4) or 5×3 (– 2) or 35 – 22	M1	Answer [9, 15] implies M1
	13	A1	
	cm^2	B1	Units mark
2(a)	23 000	B1	
2(b)	11, 15, 17, 51, 55, 57, 71, 75, 77	B3	B2 for at least six B1 for at least three Ignore repeats Do not ignore incorrect values
3(a)	[2.7, 2.9]	B1	If answer in mm, accept [27 mm, 29 mm] Ignore further working if answer seen, e.g calculating area or circumference
3(b)	[5.4, 5.8]	B1ft	ft their (a) $\times$ 2 Ignore further working if answer seen, e.g calculating area or circumference
3(c)	*d* equals 2*r* or *r* equals $\frac{1}{2}d$ diameter equals twice radius radius is half the diameter	B1	oe Accept $d = 2r$ Do not accept $d = r2$
4	3×50 or 150 seen or $2\frac{1}{2}$ hours	M1	oe
	2 hours 30 minutes	A1	SC1 for 1 hour 50 minutes

Q	Answer	Mark	Comments
5(a)	8	B1	
5(b)	11	B1	
6(a)	56 (%)	B1	
6(b)	100 – 30 (= 70)	M1	
	their 70 ÷ 2	M1dep	oe
	35	A1	65 implies M1M1A0
7(a)	Evens	B1	
7(b)	Impossible	B1	
7(c)	Two correct pairs: 1 and 3, 1 and 5, 4 and 2, 6 and 5	B2	Must be in correct order B1 for one correct pair
8(a)	651 and 602	B2	B1 for one correct (and one incorrect) or B1 for two correct and 1 incorrect
8(b)	7 and 11	B2	B1 for one correct (and one incorrect) or B1 for two correct and 1 incorrect
9(a)	Correct combination	B2	e.g. B B B B or B R R B R R R R R B B R B1 for any symmetrical pattern that is not fully correct e.g. 6B and 2R in a symmetrical pattern 2B, 2R and 4 blanks in a symmetrical pattern

Q	Answer	Mark	Comments
9(b)	Correct combination	B3	e.g. R B B R or B R R B R B B R B R R B B2 for any symmetrical pattern that is not fully correct with **two** lines of symmetry Minimum requirement 4 cells completed with Rs and/or Bs B1 for any symmetrical pattern that is not fully correct with **one** line of symmetry Minimum requirement 4 cells completed with Rs and/or Bs
10	$\frac{9}{12}$	M1	
	$\frac{3}{4}$	A1	SC1 for correctly simplifying an incorrect fraction or answer $\frac{1}{4}$
11	x^2	B1	$x \times x$
	y^3	B1	$y \times y \times y$
12	false	B1	
	true	B1	
	false	B1	
	false	B1	
	true	B1	
	true	B1	
13(a)	4	B1	
13(b)	23	B1	
13(c)	21	B1	

Q	Answer	Mark	Comments
14(a)	60(°) seen or implied	B1	Accept [58, 62] May be on the diagram
	$\frac{360}{60} \times 3$ oe	M1	Accept these valid statements 20(°) seen 9 films = 180(°) 3 (+) 6 (+) 9 $\frac{360}{60}$ (= 6) $\frac{1}{6}$ 60×6
	18	A1	SC1 Comedy angle 120° (± 2(°)) used **and** answer 9
14(b)	[118°, 122°] ÷ their 60×3 or 6 seen (may be on the diagram in the Romance section)	M1	3×2 or romance is double comedy
	3	A1	
15	Scale factor 1.5 or 2 or $(1.36) \times 1.5$ or $\frac{(1.36)}{2}$ or $(92) \times 2$ or 68 or 0.68	B1	oe
	1.36×1.5 or 1.36 + 0.68 or 136 + 68 1.36×1.5 or $1.36 \div 2$	M1	
	92×2 or 92 + 92 or 46×4 $1.36 \times 1.5 \div 2$	M1	oe
	204 and 184 or 2.04 and 1.84 102 (and 92) or 1.02 (and 0.92)	A1	If other quantities used must be a consistent pair e.g. 408 **and** 368
	400 gram indicated	Q1 ft	Strand (iii) ft their consistent prices Dependent on M1 M1

Q	Answer	Mark	Comments	
16(a)	8	B1	Accept [7.9, 8.1]	
16(b)	their 8×100	M1	oe	
	[750, 850]	A1 ft		
16(c)	$150 \div 1.75$	M1	1.75×85	1.75×86
	85.(714...) or 86	A1	148.75	150.5
	85.71 or 85.72	Q1 ft	Strand (i) for correct money notation 85 or 85.7 implies M1A1	
17(a)	18.3 or $\frac{183}{10}$	B1		
17(b)	8.36 or $\frac{836}{100}$ or $\frac{209}{25}$	B1		
17(c)	0.65 or $\frac{65}{100}$ or $\frac{13}{20}$	B1		
18	3 correct squares shaded	B2	B1 3 correct and 1 incorrect or 2 correct and none or 1 incorrect	
19(a)	$\frac{3}{8}$	B2	oe B1 for numerator 3 or denominator 8 B1 3 out of 8 B0 3 : 8	
19(b)	$\frac{7}{8}$	B2	oe B1 for numerator 7 or denominator 8 B1 for 7 out of 8 B0 7 : 8 B1 for $(1 -) \frac{1}{8}$	

Q	Answer	Mark	Comments
20(a)	-1	B1	
	3	B1	
20(b)	At least three correct points plotted	M1	Ignore incorrect points
	Straight ruled line drawn from $x = -2$ to $x = 3$	A1	
21	$11 \times 3 \times 4$	M1	
	132	A1	
22	$6x + 12$ (+ 8)	M1	$3(2x + 4) = 50 - 8$
	$6x$ + their 20 = 50 or $6x + 12 = 42$	M1	$2x + 4 = \frac{\text{their } 42}{3}$ Note: their 20 = their 12 + 8 Terms simplified on each side
	$6x = 50 - 8 - 12$ or $6x = 30$	M1dep	$2x = \frac{\text{their } 42}{3} - 4$ Terms collected Dependent on at least one other M mark
	5	A1	

Q	Answer	Mark	Comments
23	$\frac{18}{25}$ ($\times$ 100) (= 72(%)) or $\frac{72}{100}$ or 18 ÷ 25 or 0.72 oe	M1	Working with marks lost $\frac{7}{25}$ ($\times$ 100) (= 28(%)) or $\frac{28}{100}$ or 7 ÷ 25 or 0.28 oe
	$\frac{30}{40}$ ($\times$ 100) (= 75(%)) or $\frac{75}{100}$ or 30 ÷ 40 or 0.75 oe	M1	$\frac{10}{40}$ ($\times$ 100) (= 25 (%)) or $\frac{25}{100}$ or 10 ÷ 40 or 0.55 oe Note: 18 $\times$ 8 and 30 $\times$ 5 implies M2
	Test B and correct pair compared (30 out of 40)	A1	e.g. 0.72 and 0.75 72 and 75 144 and 150 (marks out of 200) 28 and 25 (% incorrect)
Alt 2	18 ÷ 25 or 30 ÷ 40	M1	
	18 ÷ 25 × 40 or 30 ÷ 40 × 25	M1	
	Test B and correct pair compared (30 out of 40)	A1	e.g. 28.8 (and 30) or 18.75 (and 18)
24	$B = D$ seen or implied	M1	May be on diagram
	$x + 2x + 2x$ (+ 50 = 360) or $\frac{1}{2}y + y + y$ (+ 50 = 360)	M1dep	oe 2 + 2 + 1 (parts) 1 + 1 + $\frac{1}{2}$ (parts)
	$x + 2x + 2x = 360 - 50$ or $5x = 360 - 50$ or $\frac{1}{2}y + y + y = 360 - 50$ or $2.5y = 360 - 50$	M1dep	oe 5 parts = 360 – 50 2.5 parts = 360 – 50 or 310 ÷ 2.5 or 124
	62	A1	SC3 for 155 SC2 for 77.5

Q	Answer	Mark	Comments
25	$\frac{1}{2} \times 8.6 \times 5.2$	M1	oe
	22.36	A1	
	22.4	B1 ft	ft from 2 d.p. or more
26	2.2 → 28(.248) (and too small) or Trial evaluated correctly for 2.2 < trial < root	B1	If equation has been rearranged to equal 0 2.2 ➔ –(1.752) If equation has been rearranged to 0 = 2.2 ➔ +(1.752)
	2.3 → 30.5(67) (and too big) or Trial evaluated correctly for root < trial < 2.3	B1	If equation has been rearranged to equal 0 2.3 ➔ +(0.567) If equation has been rearranged to 0 = 2.3 ➔ –(0.567) Note: Root is x = 2.276…
27(a)	4 ÷ 2.5	M1	
	1.6	A1	Ignore further working
27(b)	Week 4	B1	
	Valid reason or working	Q1	Accept: 4.8, 2.3, 4.8 are total weights in weeks 1, 2 and 3 Total weight in weeks 1, 2 and 3 always less than 5kg 5.7kg caught in week 4 (so possible) Largest (total) weight caught in week 4 More than 5(kg) caught in week 4 Most weight in week 4 Do not accept: Most in week 4 More in week 4 Mean is bigger in week 4 Strand (ii) SC1 for 4.8, 2.3 4.8 and 5.7 seen

Q	Answer	Mark	Comments
28	$8.2^2 + 3.5^2$ or 79.49	M1	
	$\sqrt{8.2^2 + 3.5^2}$	M1dep	
	8.9(…)	A1	Accept 9 with working shown
29	$x + x + 3 + 4x$ $(\div 3)$	M1	oe
	$(6x + 3) \div 3$	M1dep	Condone missing brackets
	$2x + 1$	A1	
30(a)	$200 \div 5$ or $\frac{1}{5}$ seen	M1	oe
	40	A1	
30(b)	Valid statement	M1	e.g. Not (approximately) equal amounts on each number Should all be (around) 40 3 is (more than) double 4 Only 2 is near expected value Biased towards 3
	No or Cannot tell	A1	May be implied by comment