Version 1.0

General Certificate of Secondary Education

Mathematics (Linear) B
4365

Paper 1 Higher Tier

Mark Scheme

Specimen Paper

Mark Schemes

Principal Examiners have prepared these mark schemes for specimen papers. These mark schemes have not, therefore, been through the normal process of standardising that would take place for live papers.

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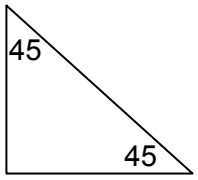
Glossary for Mark Schemes

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.
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.
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 $\frac{1}{2}$

Higher Tier

Q	Answer	Mark	Comments
1(a)	200 – 110 (boys)	M1	or $\frac{110}{200} \times 100$ or 110 ÷ 2 or 55
	$\frac{Their\ 90}{200} \times 100$ or their 90 ÷ 2	M1	or 100 – their 55
	45	A1	
1(b)	17.5 – 15 (= 2.5)	M1	
	Correct method for finding 2.5% of 140	M1	eg, 1% = 140 ÷ 100 (= 1.4) Their 1.4 × 2 + their 1.4 ÷ 2
	3.50	Q1	Strand (i) Correct notation required Do not accept 3.5
	Alternate method		
	Correct method for finding 15% of 140	M1	eg, 10% = 140 ÷ 10 (= 14) Their 14 + their 14 ÷ 2
	Correct method for finding 17.5% of 140 and subtracts	M1	Their 15% + (their 14 ÷ 2) ÷ 2
	3.50	Q1	Strand (i) Correct notation required Do not accept 3.5
2(a)	Correct reflection	B2	B1 For reflection in $x = 1$ or x-axis or y-axis
2(b)	Correct rotation	B3	B2 For 90° rotation clockwise about any point other than *O* B2 For 90° rotation **anti**clockwise about *O* B1 For 90° rotation **anti**clockwise about any point other than *O* SC2 For their *B* correctly rotated
3(a)	Line from (9, 0) to (10.5, 7.5)	B1	oe
	Horizontal line for 30 minutes from their (10.5, 7.5)	B1 ft	
	Line to (12, 0) from their (11, 7.5)	B1 ft	
3(b)	7.5	B1 ft	oe

Q	Answer	Mark	Comments
4	$2000 \times 12 \div 50 \times 5$	M1	
	2400	A1	Annual fuel bill
	$(12 \times 2000) \times (0.)10$ $(= 2400$ or $240\,000)$	M1	Annual other running cost
	$0.4 \times 24\,000$ $(= 9600)$	M1	Annual income
	$4800 > 3000$, so YES	A1 ft	Profit after deductions Their 9600 – their 2400 – their 2400
	Clear calculation of annual cost. Comparison with £3000. Conclusion drawn following through from their working	Q1	Strand (ii) - Logical argument with key steps shown leading to correct conclusion from their working
5(a)	Σxf $(3 \times 0 + 4 \times 4 + 5 \times 6 + 6 \times 9 + 7 \times 8 + 8 \times 3)$	M1	
	180	A1	
	6	A1 ft	ft Their total ÷ 30 if M1 awarded
5(b)(i)	Reference to cumulative totals for French (1, 5, 13, 21, 30)	M1	eg, 'I added the frequencies'
	5	B1	
5(b)(ii)	5 Spanish level 5 and 6 17 French level 5 and 6	B1	Lots of zeros in top right hand of table The numbers above zero are on or below the leading/main diagonal
6	Approximate isosceles triangle drawn with angle 90° shown (or right angle sign)	B1	SC1 
	At least one 45° angle shown **or** 2 sides adjacent to 90° marked as equal with numbers or a dash	B1	B0 If a side and hypotenuse marked as equal

Q	Answer	Mark	Comments
7	90 or 60 seen	B1	May be on diagram
	360 – 90 – 60 – 60	M1	
	150	A1	
	30	A1 ft	ft 180 – their 150
8	$48 + 2 \times 18$ (= 84)	M1	$48 + 2 \times 18$ (= 84)
	$(108 - 84) \div 2$ (= 12)	A1	$48 + 2 \times 18 + 2 \times 12$ (= 108)
9(a)	37	B1	
9(b)	$16 + a$	B1	$(127 - a) \div 2$
	2 × their $(16 + a) + a$	M1	$32 + 3a$, $2(16 + a) + a$
	2 × their $(32 + 3a) + a = 127$	M1	oe $64 + 7a = 127$
	$(a =)$ 9	A1	
	Alternate method		
	Evidence of multiplying 8 by 2 and adding any number	M1	Evidence of subtracting a number from 127 and dividing by 2
	Evidence of multiplying their answer by 2 and adding **the same** number	M1	Evidence of subtracting the same number from their answer and dividing by 2
	Refined attempt	M1	
	$(a =)$ 9	A1	
10(a)	$2x(x - 4)$	B1	
10(b)	$(x \pm 1)(x \pm 2)$	M1	
	$(x + 1)(x + 2)$	A1	
10(c)	$10(x^2 - 4y^2)$	M1	
	$10(x + 2y)(x - 2y)$	A2	A1 For both $\pm 2y$ or $10(x + 4y)(x - y)$

Q	Answer	Mark	Comments
11	**D**: $2x + 5y = 10$ **B**: $5x + 2y = 10$ **A**: $5y + 10 = 2x$ **C**: $2y + 10 = 5x$	B3	B2 If two correct or three correct B1 If one correct
12(a)	Opposite angles in a cyclic quadrilateral (= 180°)	B1	
12(b)	$CDB = 37° = DBA$	B1	
	$BDA = 68°$	B1	
	$BAX = 68°$	B1	
13	Answer in region $100 < T < 120$	M1	
	$\frac{20}{50}$ of 20 or sight of 8 or $\frac{30}{50}$ of 20 or sight of 12 or 100 small squares = 20 vehicles	M1	oe For example if drawn on 1 cm^2 grid, 4 cm^2 = 20 vehicles or 1 cm^2 = 5 vehicles
	112	A1	
14	$AC^2 = (4 - \sqrt{2})^2 + (4 + \sqrt{2})^2$	M1	
	Either $16 - 4\sqrt{2} - 4\sqrt{2} + 2$ or $16 + 4\sqrt{2} + 4\sqrt{2} + 2$	M1	Allow one error
	$AC^2 = 16 - 8\sqrt{2} + 2 + 16 + 8\sqrt{2} + 2$	A1	
	$= 36$ or $AC = 6$	A1	
	Perimeter $= 6 + 4 - \sqrt{2} + 4 + \sqrt{2}$ (= 14)	A1	
15	Sight of a correct product $\frac{7}{10} \times \frac{6}{9}$ or $\frac{7}{10} \times \frac{3}{9}$ or $\frac{3}{10} \times \frac{7}{9}$ or $\frac{3}{10} \times \frac{2}{9}$	M1	
	$\frac{7}{10} \times \frac{3}{9} + \frac{3}{10} \times \frac{7}{9} + \frac{3}{10} \times \frac{2}{9}$	M1	$1 - \frac{7}{10} \times \frac{6}{9}$
	$\frac{48}{90}$ or $\frac{24}{45}$ or $\frac{16}{30}$ or $\frac{8}{15}$	A1	

Q	Answer	Mark	Comments
16	Sight of $10x$ or $-3(2x-1)$ or $3x(2x-1)$	M1	
	$-6x+3$ or $6x^2-3x$	M1 dep	
	$6x^2-7x-3\ (=0)$	A1	
	$(2x-3)(3x+1)\ (=0)$	M1	
	$x=1.5$ or $-\frac{1}{3}$	A1	
	Full answer with stages clearly shown ie, combines fractions, multiplies denominator through, re-arranges to a quadratic and attempts to solve	Q1	Strand (ii) Logical, structured algebraic argument