



General Certificate of Secondary Education

Methods in Mathematics 9365

Unit 1 Higher Tier 93651H

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. (QWC)
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 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 $\frac{1}{2}$
eeoo	Each error or omission.

M1 Higher Tier

Section A

Q	Answer	Mark	Comments
1	C, F, T, T All correct	B3	
	3 correct	B2	
	2 correct	B1	
2	Identifying any number whose digits have a sum of 9 other than 18	M1	$2 + 7 = 9$ etc.
	Identifying the 9 times table	A1	
	9	A1	
3	Points plotted accurately	B1	$\pm \frac{1}{2}$ square
	Smooth curve through correct plots	B1	$\pm \frac{1}{2}$ square
	$x = 1.7$	B1	Allow 1.6 - 1.8
4	$7x - 3x = 5 + 9$	M1	Allow one sign error
	$4x = 14$	A1	
	$3.5, 3\frac{1}{2}, \frac{14}{4}, \frac{7}{2}$	A1ft	ft On one error only
5	$x^2 - 3x + 4x - 12$	M1	4 terms with 3 correct including signs
	$x^2 + x - 12$	A1	
6(a)(i)	$\frac{3}{6}$ or $\frac{1}{2}$	B1	
6(a)(ii)	$\frac{5}{6}$	B1	
6(b)	Denominator 10	M1	
	Numerator 6	A1	$\frac{3}{5}$ is B2

Q	Answer	Mark	Comments
7	Sight of $x - 3$ or $2x$	B1	
	$x + x - 3 + 2x = 25$	M1	Allow M1 for sum of any 2 of x , $x - 3$ or $2x = 25$
	$4x - 3 = 25$	A1	
	7	A1ft	ft Their equation if M1 awarded. $x + x - 3 = 25$ gives $x = 14$ $x + 2x = 25$ gives $x = 8.33...$ $x - 3 + 2x = 25$ gives $9.33...$
Alt 7	Three values with a total of 25	M1	
	Two values that differ by 3 or two values where one is twice the other	M1	Pair of values must not add to more than 25
	14, 7, 4	A1	
	7	A1	
8	1.16 seen	B1	
	$3248 \div 1.16$	M1	
	2800	A1	
8 Alt	$116 (\%) = 3248$ seen	B1	$1.16 = 3248$
	$(1\%) = 3248 \div 116$	M1	$(1 =) 3248 \div 1.16$
	2800	A1	
9	$2y = x - 5$	M1	
	$x = 2y + 5$	A1	Must have $x =$
10(a)	0.0042	B1	
10(b)	2.6×10^{10}	B2	B1 For $2.6 \times 10^{\text{any power}}$ or any equivalent correct answer not in SF form

Q	Answer	Mark	Comments
11	$xy = (x - 3)(y + 2)$ or $xy = (x + 3)(y - 1)$ or $(y + 2)(x - 3) = (y - 1)(x + 3)$	M1	
	$xy - 3y + 2x - 6$ or $xy - x + 3y - 3$	M1	
	$xy - 3y = 6$ or $-x + 3y = 3$ or $3x - 6y = 3$	A1	
	Eliminates using their equations	M1	
	$x = 9, y = 4$	A1	QWC Strand (ii) - A structured argument using accurate mathematical language is essential to obtain full marks
12(a)	290	B1	
12(b)	250	B1	
13	$n^2 + 5n + 5n + 25 -$ $(n^2 + 3n + 3n + 9)$	M1	Allow invisible bracket
	$n^2 - n^2 + 10n - 6n + 25 - 9$	A1	Must show that the minus sign has been properly dealt with
	Either $4n + 16 = 4(n + 4)$ or $4(n + 4) = 4n + 16$	A1	This must be stated clearly QWC Strand (ii) - A structured argument using accurate mathematical language is essential to obtain full marks
Alt 13	Attempt at difference of two squares	M1	
	$(n + 5 + n + 3)(n + 5 - n - 3)$	A1	
	$(2n + 8)(2)$	A1	QWC Strand (ii) - A structured argument using accurate mathematical language is essential to obtain full marks

Q	Answer	Mark	Comments
Section B			
14	$(P(Y =)) 0.2$	B1	
	600×0.2	M1	
	120	A1	
15	A = 4 B = 1 C = 6 D = 2 E = 5	B3	B2 For 3 or 4 correct B1 For 2 correct SC B1 For C = 0, 1, 5 or 6
16	$\frac{15}{4} - \frac{5}{3}$	M1	
	$\frac{45}{12} - \frac{20}{12}$	A1	Any common denominator
	$2\frac{1}{12}$ or $\frac{25}{12}$	A1	
Alt 16	$(3 - 1) + \frac{3}{4} - \frac{2}{3}$	M1	
	$2 + \frac{9}{12} - \frac{8}{12}$	A1	Any common denominator
	$2\frac{1}{12}$ or $\frac{25}{12}$	A1	
17(a)	Evidence of attempting to find a gradient	M1	Any combination of 2 and 3 either as a fraction or ratio. Ignore any minus signs
	$\frac{3}{2}$	A1	oe
17(b)	$y = \frac{3}{2}x - 1$	B1	ft Their gradient if M awarded in (a) Must have $y =$
18(a)	S, A, N	B3	B1 Each
18(b)	Two odd numbers	B1	

Q	Answer	Mark	Comments
19	$3(x + 3) - 2(x - 2)$	M1	
	$3x + 9 - 2x + 4$	A1	$x + 13$ QWC Strand (i) – Expression fully correct including signs
	Their $x + 13 = 18$	M1	
	5	A1ft	QWC Strand (ii) ft If both Ms awarded clearly presented and only one error
20(a)	0.4, 0.4, 0.6, 0.4	B1	oe
20(b)	0.6×0.6 or their 0.4×0.4	M1	oe
	$0.4 \times 0.4 + 0.6 \times 0.6$	M1 dep	ft Their values in (a)
	0.52	A1ft	oe ft Their values in (a) Final value must be < 1 for A1ft
Alt 20(b)	$1 - (0.6 \times 0.4)$	M1	oe
	Their $0.76 - (0.4 \times 0.6)$	M1 dep	oe ft Their values in (a)
	0.52	A1ft	oe ft Their values in (a) Final value must be < 1 for A1ft
21(a)	$y = k\sqrt{x}$	M1	
	$15 = k\sqrt{25}$	M1	
	$y = 3\sqrt{x}$	A1	
21(b)	When y doubles, the value of x multiples by 4	Q2	QWC Strand (iii) 2 marks for a full and clearly set out solution 1 mark for a partial or unclear solution Q1 For When $y = 30$ $30 = 3 \times \sqrt{x}$ $10 = \sqrt{x}$ or $x = 100$ or explanation such as ... When y doubles then \sqrt{x} doubles ie, \sqrt{x} is multiplied by 2 or x is multiplied by 2^2

Q	Answer	Mark	Comments
22	$2 \times \sqrt{(6^2 - 3^2)}, \frac{9}{\sqrt{27}}$	B1	
	$\sqrt{27} = 3\sqrt{3}$	B1	
	Rationalises the denominator	M1	
	$\sqrt{3}$	A1	
23	$(x - 3)(x + 3)$	B1	
	$(2x + 1)(x - 3)$	B1	
	$\frac{x + 3}{2x + 1}$	B1	
24	$64 = k^3$	M1	
	$k = 4$	A1	
	$a = 16$	B1	
	$b = 1.5$	B1	QWC Strand (ii) - A structured argument using accurate mathematical language is essential to obtain full marks