

2008 Mathematics

Intermediate 2 – Units 1, 2 and Applications Paper 1

Finalised Marking Instructions

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General Marking Principles

These principles describe the approach to be taken when marking Intermediate 2 Mathematics papers. For more detailed guidance please refer to the notes which are included with the Marking Instructions.

- 1 Marks must be assigned in accordance with the Marking Instructions. The main principle in marking scripts is to give credit for the skills demonstrated and the criteria met. Failure to have the correct method may not preclude a candidate gaining credit for the calculations involved or for the communication of the answer.
- 2 The answer to one part of a question, even if incorrect, must be accepted as a basis for subsequent dependent parts of the question. Full marks in the dependent part(s) may be awarded provided the question is not simplified.
- **3** The following should not be penalised:
 - working subsequent to a correct answer (unless it provides firm evidence that the requirements of the question have not been met)
 - omission or misuse of units (unless marks have been specifically allocated for the purpose in the marking scheme)
 - bad form, eg sin $x^\circ = 0.5 = 30^\circ$
 - legitimate variation in numerical values / algebraic expressions.
- 4 Solutions which seem unlikely to include anything of relevance must nevertheless be followed through. Candidates still have the opportunity of gaining one mark or more provided the solution satisfies the criteria for the mark(s).
- 5 Full credit should only be given where the solution contains appropriate working. Where the correct answer may be obtained by inspection or mentally, credit may be given, but reference to this will be made in the Marking Instructions.
- 6 In general markers will only be able to give credit for answers if working is shown. A wrong answer without working receives no credit unless specifically mentioned in the Marking Instructions. The rubric on the outside of the question papers emphasises that working must be shown.
- 7 Sometimes the method to be used in a particular question is explicitly stated; no credit should be given where a candidate obtains the correct answer by an alternative method.
- 8 Where the method to be used in a particular question is not explicitly stated, full credit must be given for alternative methods which produce the correct answer.
- 9 Do not penalise the same error twice in the same question.
- 10 Do not penalise a transcription error unless the question has been simplified as a result.
- 11 Do not penalise inadvertent use of radians in trigonometry questions, provided their use is consistent within the question.

Practical Details

The Marking Instructions should be regarded as a working document and have been developed and expanded on the basis of candidates' responses to a particular paper. While the guiding principles of assessment remain constant, details can change depending on the content of a particular examination paper in a given year.

- 1 Each mark awarded in a question is referenced to one criterion in the marking scheme by means of a bullet point.
- 2 Where a candidate has scored zero marks for any question attempted, "0" should be shown against the answer in the place in the margin.
- 3 Where a marker wishes to indicate how s/he has awarded marks, the following should be used:
 - (a) Correct working should be ticked, \checkmark .
 - (b) Where working subsequent to an error is followed through, if otherwise correct and can be awarded marks, it should be marked with a crossed tick, X.
 - (c) Each error should be underlined at the point in the working where it first occurs.
- 4 Do not write any comments, words or acronyms on the scripts.

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
1	 Ans: gradient is 4 •¹ interpret: find gradient 	• ¹ 4
		1 mark
NOTES:		
1. F	For an answer of $m = 4$, $c = 5$	award 0/1
2. F	For $4x$	award 0/1
2	Ans: $3x^2 - 5x - 10$	
	• ¹ process: start to multiply out brackets	• evidence of 2 correct terms (eg $3x^2 - 15x$)
	• ² process: complete process of multiplying out brackets	• ² $3x^2 - 15x + 2x - 10$
	• ³ process: collect like terms which must include x^2 term	$\bullet^3 3x^2 - 5x - 10$
		3 marks
NOTES:	<u></u>	·

Mathematics Intermediate 2: Paper 1, Units 1, 2 and Applications (non-calc)

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
3 (a)	 Ans: 12th •¹ interpret: interpret diagram 	• ¹ 12th 1 mark
NOTES:		
(b)	 Ans: 5/20 or equivalent •¹ process: calculate probability 	$\bullet^1 \frac{5}{20}$ 1 mark
NOTES: 1. <i>A</i>	Accept variations eg 5 : 20 0.25 25% 5 out of 20	

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
4 (a)	Ans: $(x + y)(x - y)$	
	\bullet^1 process: factorise correctly	• ¹ $(x+y)(x-y)$
		1 mark
NOTES:		
(b)	Ans: 86	
	• ¹ strategy: know to substitute in expression	• ¹ $(9 \cdot 3 + 0 \cdot 7)(9 \cdot 3 - 0 \cdot 7)$
	\bullet^2 process: evaluate expression	• ² 86
		2 marks
NOTES:	·	
1. 4	Alternative method	
	•1 strategy: know how to evaluate expression	• ¹ evidence of 9.3×9.3 -0.7×0.7
	• ² process: evaluate expression	• ² 86
2.]	For $9 \cdot 3^2 - 0 \cdot 7^2$ = $81 \cdot 9 - 4 \cdot 9$ = 77, with no additional working,	award 0/2

Question	Marking Scheme	Ill	ustrations of evidence for a	warding a
No	Give 1 mark for each •		mark at each ●	
5 (a)	 Ans: 1, 3, 6, 11, 16, 22, 24, 25 •¹ communicate: table with cumulative frequency column 	• ¹	1, 3, 6, 11, 16, 22, 24, 25	1 mark
NOTES:				
(b)	Ans: $Q_2 = 4, Q_1 = 2 \cdot 5, Q_3 = 5$			
	• ¹ communicate: state median	• ¹	$Q_2 = 4$ $Q_1 = 2 \cdot 5$	
	\bullet^2 communicate: state lower quartile	• ²	$Q_1 = 2 \cdot 5$	
	• ³ communicate: state upper quartile	•3	Q ₃ = 5	
				3 marks
NOTES:				
۷	Where the quartiles have been obtained from			
(i) Number of books leading to $Q_2 = 3.5, Q_1 = 1.5, Q_3 = 5.5$		2	ward 0/3
(ii) Frequency (unordered) leading to $Q_2 = 5, Q_1 = 2.5, Q_3 = 4$		2	ward 0/3
(iii) Frequency (ordered) leading to $Q_2 = 2.5, Q_1 = 1.5, Q_3 = 5$		2	ward 0/3
(iv) Cumulative frequency leading to $Q_2 = 13.5, Q_1 = 4.5, Q_3 = 23$		2	ward 0/3
(c)	Ans: 1.25			
	• ¹ process: calculate SIQR	•1	1.25	
				1 mark
NOTES:				

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence fo mark at each	
(d)	 Ans: number of textbooks more spread out for girls •¹ communicate: a valid statement 	\bullet^1 a valid statement	1 mark
NOTES:			
6	 Ans: 40 sq cm ¹ strategy: know how to find area ² process: calculate area correctly 	• ¹ area = $\frac{1}{2} \times 16 \times 20 \times \frac{1}{4}$ • ² 40	2 mark
NOTES:	1	1	
1. For $(\frac{1}{2} \times 16 \times 20 \times \sin \frac{1}{4})$ leading to an answer of 40 cm ²			award 1/2
2. For an answer of 40 cm^2 , without working			award1/2
3. For an answer of 160 cm ² ($\frac{1}{2} \times 16 \times 20$)			award 0/2

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •	
7	Ans: 19°		
	• ¹ process: state the size of $\angle ABD$	• ¹ 90°	
	• ² process: calculate the size of $\angle BAD$	• ² 44 ^o	
	• ³ process: calculate the size of $\angle BAC$	• ³ 19°	
		3 marks	
NOTES:	·		
1. <u>A</u>	Alternative method		
•	• ² process: calculate the size of \angle BEA (where E is the point of intersection of AC and BD) • ² 71°		
2. Angle ABD, angle BAD and angle BEA may not be explicitly stated, they may be marked in a diagram and can be awarded the first and second marks.			
3. A	3. A correct answer, without working. award 3/3		
8	Ans: T, U		
	• ¹ communicate: state letters	• ¹ T, U	
		1 mark	
NOTES:	1		

Marking Scheme	Illustrations of evidence for awarding a
Give 1 mark for each •	mark at each •
Ans: £3600	
\bullet^1 interpret: choose correct path	• ¹ NO followed by NO
• ² process: carry out calculations correctly	$v \bullet^2 $ £3600
	2 marks
Answers with or without working	
£3600	award 2/2
£2400	award 1/2
£1200	award 0/2
 Ans: histogram ¹ process: choose suitable scales and label both axes ² process: correctly draw histogram 	 a b a a b a a b a b a b a b a a b a a b a a b a a a a b a a
E	Ans: £3600 • ¹ interpret: choose correct path • ² process: carry out calculations correctly Answers with or without working 23600 22400 21200 Ans: histogram • ¹ process: choose suitable scales and

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
(b)	Ans: 18 hours	
	\bullet^1 communicate: state mode	• ¹ 18
		1 mark
NOTES:		
1.	Where an invalid method has been used leading to an answer of 18 award 0/1	
(c)	Ans: (On average) students spend more time watching television than studying	
	• ¹ communicate: one valid statement	• ¹ a valid statement
		1 mark
NOTES:	<u>.</u>	·
1.	COMMON WRONG ANSWER	
	"More students spend time watching TV than studying" award 0/1	
2.	Where a candidate refers to 2 different groups of students award 0/1	

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
11	Ans: 45	
	• ¹ strategy: substitute correctly into formula	• ¹ $\frac{3(2^4-1)}{2-1}$
	• ² process: correctly evaluate 2^4	• ² 16
	• ³ process: complete calculation of S	• ³ 45
		3 marks
NOTES:		
1.	For an answer of $\frac{45}{1}$, with working,	award 3/3
2.	Where 2^4 has been calculated incorrectly, full third mark	working must be shown for the award of the
eg	$\frac{3(2^4-1)}{2-1} = \frac{3(31)}{1} = 93$	award 1/3
	$\frac{3(2^4-1)}{2-1} = \frac{3(32-1)}{1} = 93$	\checkmark ×× award 2/3
		√×√

TOTAL MARKS FOR PAPER 1 30

[END OF MARKING INSTRUCTIONS]