2009 Mathematics

Intermediate 2 – Units 1, 2 and 3 Paper 1

Finalised Marking Instructions

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 $x° = 0.5 = 30°$
- 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:

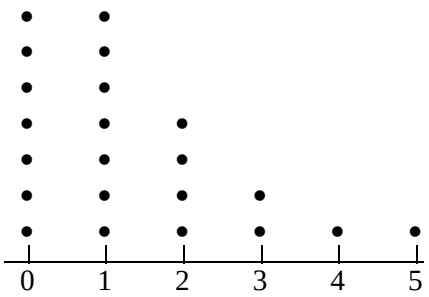
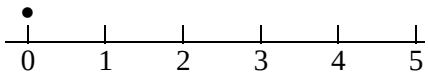
(a) Correct working should be ticked, ✓.

(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, ✓̸.

(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.**

Mathematics Intermediate 2: Paper 1, Units 1, 2 and 3 (non-calc)

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
1 (a)	**Ans:**  •[1] process: start to draw dotplot •[2] process: complete dotplot	•[1] evidence (see note 1) •[2] complete dotplot **2 marks**
NOTES: 1. Minimum acceptable evidence for the award of the first mark  		
(b)	**Ans: A** •[1] communicate: state correct letter	•[1] A **1 mark**
NOTES: 1. Accept "skewed to the right".		

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
2	**Ans:** $y = 3x - 1$ •[1] process: find gradient •[2] process: state y-intercept or c in $y = mx + c$ •[3] communicate: state correct equation of line	•[1] m = 3 (or equivalent) •[2] c = -1 •[3] $y = 3x - 1$ **3 marks**

NOTES:

1. For correct answer without working — award 3/3
2. For $y = 3x$ — award 1/3
3. Where m and/or c are incorrect the working must be followed through to give the possibility of awarding 1/3 or 2/3
4. If the equation is stated incorrectly and there is no working, 1/3 can be awarded for correct gradient or correct y-intercept
5. For an incorrect equation (ie both m and c incorrect) without working, eg $y = -x + 3$ — award 0/3

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
3	**Ans:** $(x - 8)(x + 3)$ •[1] process: start to factorise •[2] process: complete factorisation	•[1] one correct factor •[2] $(x - 8)(x + 3)$ **2 marks**

NOTES:

1. For the following answers — award 1/2

$(x - 24)(x + 1)$
$(x + 24)(x - 1)$
$(x - 12)(x + 2)$
$(x + 12)(x - 2)$
$(x + 8)(x - 3)$
$(x - 6)(x + 4)$
$(x + 6)(x - 4)$

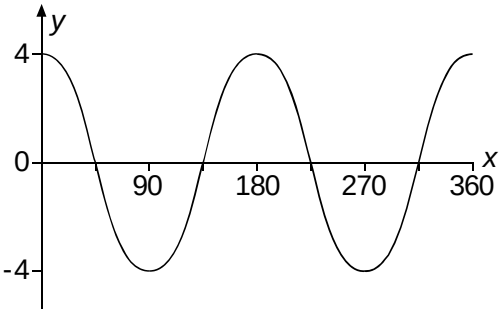
Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
4	**Ans:** $2x^3 + 7x^2 - 16x - 5$ •[1] process: start to multiply out brackets •[2] process: complete the process of multiplying out brackets correctly •[3] process: collect like terms which must include x^3 term	•[1] evidence of 3 correct terms (eg $2x^3 - 3x^2 - x$) •[2] $2x^3 - 3x^2 - x + 10x^2 - 15x - 5$ •[3] $2x^3 + 7x^2 - 16x - 5$ **3 marks**
NOTES: 1. Where candidates have attempted to 'simplify' beyond the correct answer, the 3rd mark is not available.		
5 (a)	**Ans: (i) 58·5 (ii) 11** **(i)** •[1] process: calculate median **(ii)** •[1] process: calculate lower quartile •[2] process: calculate upper quartile •[3] process: calculate SIQR	•[1] 58·5 **1 mark** •[1] 45 •[2] 67 •[3] 11 **3 marks**
NOTES: 1. An incorrect answer for the median must be followed through with the possibility of awarding full marks for part (ii).		

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
(b)	**Ans: In December, the marks (on average) are better and less spread out.** •[1] communicate: make a valid comment •[2] communicate: make a second valid comment	 •[1] comment •[2] comment **2 marks**

NOTES:

1. For an answer like "marks are better and less spread out" award 0/2

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
6	**Ans: Any value for *a* such that 270 < *a* < 360.** •[1] communicate: state possible size of *a*	•[1] any size between 270 and 360 **1 mark**
NOTES:		
7	**Ans: -1** •[1] strategy: know how to find gradient •[2] communicate: state gradient	•[1] $y = -x + 5$ or correct graph •[2] -1 **2 marks**
NOTES: 1. Correct answer without working — award 2/2 2. For an answer of m = –1, c = 5, with or without working — award 1/2		

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
8	**Ans: The graph of $y = 4\cos 2x^\circ$ drawn from 0° to 360°**  •[1] process: know the max = 4 and min = -4 •[2] process: show that there are 2 cycles in 360° •[3] communicate: curve correctly drawn	•[1] evidence from graph •[2] evidence from graph •[3] evidence **3 marks**

NOTES:

1. For a sketch of the curve $y = 2\cos 4x°$, for $0 \le \times \le 360$ award 2/3
2. Disregard poor draughtsmanship.

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
9 (a)	**Ans:** $x = -3$ •[1] communicate: state equation	•[1] $x = -3$ **1 mark**
NOTES: 1. For an answer of $(=)-3$ award 0/1		
(b)	**Ans:** $y = (x+3)^2 - 4$ •[1] communicate: state equation in correct form, with *a* or *b* correct •[2] communicate: complete equation	•[1] $y = (x+3)^2 + b$ •[2] $y = (x+3)^2 - 4$ **2 marks**
NOTES: 1. For $y = (x+4)^2 - 3$ award 0/2		
(c)	**Ans: (0,5)** •[1] strategy: know to substitute $x = 0$ in equation •[2] communicate: state coordinates of C	•[1] $y = (0+3)^2 - 4$ •[2] (0,5) **2 marks**
NOTES: 1. For a correct answer, without working, award 2/2		

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
10	**Ans: cos x°** •^{1} strategy: replace $1-\sin^2 x^\circ$ with $\cos^2 x^\circ$ •^{2} process: cancel $\cos^2 x^\circ$	 •^{1} $\dfrac{\cos^3 x^\circ}{\cos^2 x}$ •^{2} $\cos x^\circ$ **2 marks**

NOTES:

1. For a correct answer, without working, award 0/2

TOTAL MARKS FOR PAPER 1
30

[END OF MARKING INSTRUCTIONS]