

2006 Mathematics

Intermediate 1 Units 1, 2 + 3 Paper 1

Finalised Marking Instructions

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General Marking Principles

These principles describe the approach to be taken when marking Intermediate 1 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, ✓.
 - (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 1: Paper 1, Units 1, 2 and 3

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
1	Ans: 3·62 • ¹ process: calculate $5\cdot42 - 1\cdot8$	• ¹ 3·62 1 mark
2	Ans: 167 • ¹ interpret: know to multiply 11 by 12 and then add 35 • ² process: evaluate rule (multiplication must involve [number > 10] × 12)	• ¹ $11 \times 12 + 35$ • ² 167 2 marks
NOTES: 1 Correct answer without working award 2/2 2 132 (11×12) (no working necessary) award 1/2 3 $11 \times 2 \times 10 + 35$ (working must be shown) award 1/2		
3	Ans: 4m 10s • ¹ strategy: know to divide 1500 by 6 • ² process: divide correctly • ³ process: convert to minutes and seconds correctly	• ¹ $1500 \div 6$ • ² 250 • ³ 4m 10s 3 marks
NOTES: 1 Correct answer without working award 3/3 2 $1500 \div 6 \rightarrow 2\text{m } 50\text{s}$ (working must be shown) award 2/3 3 $1500 \times 6 = 9000 \div 60 = 150$ (working must be shown) award 1/3 4 3 rd mark is not available for (a) 4 hr 10 min (b) converting a multiple of 60 seconds to minutes		

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
4	<p>Ans: £162</p> <ul style="list-style-type: none"> •¹ interpret: interpret table •² strategy: know to calculate $2 \times \text{adult} + 70\% \text{ of adult}$ •³ process: carry out <u>all</u> calculations correctly (must at least involve a percentage calculation) 	<ul style="list-style-type: none"> •¹ 60 •² $2 \times 60 + 70\% \text{ of } 60$ •³ 162 <p style="text-align: right;">3 marks</p>

NOTES:

	<u>Final answer</u>	<u>with working</u>	<u>without working</u>
1 (a)	162	3/3	3/3 ✓✓✓
(b)	$60 + 60 + 70\% \text{ of } 120 = 204$	2/3	0/3 ✓ × ✓
(c)	$60 + 60 + 30\% \text{ of } 60 = 138$	2/3	0/3 ✓ × ✓
(d)	$70\% \text{ of } 60 = 42$	2/3	0/3 ✓ × ✓
(e)	$70\% \text{ of } (30 + 30) = 42$	1/3	0/3 × × ✓
(f)	$60 + 60 = 120$	1/3	0/3 ✓ × ×

5	<p>Ans: £46</p> <ul style="list-style-type: none"> •¹ strategy/process: correctly subtract 85 from 499 •² strategy: know to divide answer by 9 •³ process: divide correctly 	<ul style="list-style-type: none"> •¹ 414 •² $414 \div 9$ •³ 46 <p style="text-align: right;">3 marks</p>
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NOTE:

<u>Final answer</u>	<u>with working</u>	<u>without working</u>
46	3/3	2/3
$64 \cdot 89, 64 \cdot 88 ([499 + 85] \div 9)$	2/3	1/3
$55 \cdot 44, 55 \cdot 45 (499 \div 9)$	1/3	0/3
$9 \cdot 44, 9 \cdot 45 (85 \div 9)$	1/3	0/3

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
6	<p>Ans: $n = 6$</p> <ul style="list-style-type: none"> •¹ process: start to collect like terms •² process: collect like terms <u>and</u> equate •³ process: solve equation for n 	<ul style="list-style-type: none"> •¹ $7n$ or 42 •² $7n = 42$ •³ $n = 6$ <p style="text-align: right;">3 marks</p>

NOTES:

- 1 For answers without valid working award 0/3
eg (i) $n = 6$ without working
(ii) $5 \times 6 + 9 = 51 - 2 \times 6 \rightarrow n = 6$
- 2 Only one of the first two marks can be awarded if $7n$ and 42 are not equated
- 3 For the award of the 3rd mark an answer of the form $n =$ is required
- 4 Answers acceptable for partial credit (valid working must be shown)
 - (i) $7n = 42 \rightarrow 6$
 - (ii) $7n = 60 \rightarrow n = 8.5.....$
 - (iii) $3n = 42 \rightarrow n = 14$
 - (iv) $3n = 60 \rightarrow n = 20$

} } award 2/3
award 1/3

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •								
7 (a)	<p>Ans:</p> <table border="1"> <tr> <td>x</td> <td>-3</td> <td>0</td> <td>2</td> </tr> <tr> <td>y</td> <td>-7</td> <td>2</td> <td>8</td> </tr> </table> <p>•¹ process: calculate y</p> <p>•² process: complete table</p>	x	-3	0	2	y	-7	2	8	<p>•¹ -7</p> <p>•² -7, 2, 8</p> <p style="text-align: right;">2 marks</p>
x	-3	0	2							
y	-7	2	8							
(b)	<p>Ans: straight line graph of $y = 2 + 3x$</p> <p>•¹ communicate: prepare to draw line</p> <p>•² communicate: draw the line $y = 2 + 3x$</p>	<p>•¹ all three points from the table plotted correctly</p> <p>•² draw straight line through the three points (see note 2)</p> <p style="text-align: right;">2 marks</p>								
<p>NOTES:</p> <p>1 If the line $y = 2 + 3x$ is drawn award 2/2</p> <p>2 Where the three points plotted are consistent with table and are not collinear, the second mark is unavailable.</p>										

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •															
8	<p>Ans: £1.05</p> <ul style="list-style-type: none"> •¹ strategy: correct method •² process: start calculation •³ process: complete calculation 	<ul style="list-style-type: none"> •¹ $\frac{3}{5}$ of $70 \times 2\frac{1}{2}$ •² $\frac{3}{5}$ of $70 = 42$ or $70 \times 2\frac{1}{2} = 175$ or $\frac{3}{5}$ of $2\frac{1}{2} = 1.5$ •³ 105 <p style="text-align: right;">3 marks</p>															
<p>NOTES:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 75%;">105 with no working</td> <td style="width: 20%; text-align: right;">award 0/3</td> </tr> <tr> <td style="text-align: center;">2</td> <td><u>Final answer (working must be shown)</u></td> <td></td> </tr> <tr> <td></td> <td style="padding-left: 20px;">(a) 1.05 (no units necessary)</td> <td style="text-align: right;">award 3/3</td> </tr> <tr> <td></td> <td style="padding-left: 20px;">(b) £105</td> <td style="text-align: right;">award 2/3</td> </tr> <tr> <td style="text-align: center;">3</td> <td>$150 \times 70 = 10500 \times \frac{3}{5} = 6300$</td> <td style="text-align: right;">award 1/3</td> </tr> </table>			1	105 with no working	award 0/3	2	<u>Final answer (working must be shown)</u>			(a) 1.05 (no units necessary)	award 3/3		(b) £105	award 2/3	3	$150 \times 70 = 10500 \times \frac{3}{5} = 6300$	award 1/3
1	105 with no working	award 0/3															
2	<u>Final answer (working must be shown)</u>																
	(a) 1.05 (no units necessary)	award 3/3															
	(b) £105	award 2/3															
3	$150 \times 70 = 10500 \times \frac{3}{5} = 6300$	award 1/3															

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •
9	<p>Ans: 6</p> <ul style="list-style-type: none"> •¹ interpret: know how to evaluate formula •² process: start to evaluate •³ process: complete evaluation 	<ul style="list-style-type: none"> •¹ $\sqrt{144 \div 4}$ or $\sqrt{144} \div \sqrt{4}$ •² $\frac{144}{4} = 36$ or $\sqrt{144} = 12$ •³ 6 <p style="text-align: right;">3 marks</p>

NOTES:

1 Final answer (no working necessary)

(a) $\sqrt{36}$

award 2/3

(b) 36

award 1/3

(c) $\sqrt{\frac{144}{4}}$

award 0/3

2 Award 3rd mark for a good approximation to \sqrt{n} where n is not a perfect square
eg $\sqrt{35} = 5.$

Question No	Marking Scheme Give 1 mark for each •	Illustrations of evidence for awarding a mark at each •												
10 (a)	Ans: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px 10px;">4</td> <td style="padding: 2px 10px;">-6</td> <td style="padding: 2px 10px;">-2</td> <td style="padding: 2px 10px;">-8</td> </tr> </table> <ul style="list-style-type: none"> •¹ interpret/process: complete number cell 	4	-6	-2	-8	<ul style="list-style-type: none"> •¹ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 40px; height: 20px;"></td> <td style="width: 40px; height: 20px;"></td> <td style="width: 40px; height: 20px; text-align: center;">-2</td> <td style="width: 40px; height: 20px; text-align: center;">-8</td> </tr> </table> <p style="text-align: right;">1 mark</p>			-2	-8				
4	-6	-2	-8											
		-2	-8											
(b)	Ans: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px 10px;">-6</td> <td style="padding: 2px 10px;">5</td> <td style="padding: 2px 10px;">-1</td> <td style="padding: 2px 10px;">4</td> </tr> </table> <ul style="list-style-type: none"> •¹ strategy/process: final three numbers consistent •² strategy/process: first three numbers consistent 	-6	5	-1	4	<ul style="list-style-type: none"> •¹ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 40px; height: 20px;"></td> <td style="width: 40px; height: 20px; text-align: center;">5</td> <td style="width: 40px; height: 20px;"></td> <td style="width: 40px; height: 20px;"></td> </tr> </table> •² <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 40px; height: 20px; text-align: center;">-6</td> <td style="width: 40px; height: 20px;"></td> <td style="width: 40px; height: 20px;"></td> <td style="width: 40px; height: 20px;"></td> </tr> </table> <p style="text-align: right;">2 marks</p>		5			-6			
-6	5	-1	4											
	5													
-6														
(c)	Ans: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px 10px;">1</td> <td style="padding: 2px 10px;">-4</td> <td style="padding: 2px 10px;">-3</td> <td style="padding: 2px 10px;">-7</td> </tr> </table> <ul style="list-style-type: none"> •¹ strategy/process: experiment •² strategy/process: complete number cell 	1	-4	-3	-7	<ul style="list-style-type: none"> •^{1,2} <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 40px; height: 20px;"></td> <td style="width: 40px; height: 20px; text-align: center;">-4</td> <td style="width: 40px; height: 20px; text-align: center;">-3</td> <td style="width: 40px; height: 20px;"></td> </tr> </table> <p>(award 1 for two attempts where first three or final three numbers are consistent)</p> <p style="text-align: right;">2 marks</p>		-4	-3					
1	-4	-3	-7											
	-4	-3												
<p>NOTE:</p> <p style="text-align: center;">The correct answer need not appear in the intended number cell for it to be acceptable.</p>														

TOTAL MARKS FOR PAPER 1

30

[END OF MARKING INSTRUCTIONS]