# 2011 Mathematics

# Intermediate 1 Units 1, 2 & 3 Paper 1

# Finalised Marking Instructions

**Part One: General Marking Principles for Mathematics Intermediate 1 Units 1, 2 & 3 Paper 1**

*This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.*

**1.** Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from the Principal Assessor. You can do this by posting a question on the Marking Team forum. Alternatively, you can refer the issue directly to the Principal Assessor by completing a Principal Assessor Referral form and returning it with the script in the normal way.

**2.** Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

**3.** Award one mark for each 'bullet' point shown in the Marking Instructions.

**4.** Working subsequent to an error must be followed through with the possibility of awarding all remaining marks for the subsequent working, provided the question has not been not simplified as a result of the error. In particular, 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 has not been not simplified.

**5.** 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 marks.

**6.** 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 Instructions)
- bad form, eg $\sin x° = 0{\cdot}5 = 30°$
- legitimate variation in numerical values/algebraic expressions.

**7.** 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.

**8.** In general only 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 page one of the question paper states that 'full credit will be given only where the solution contains appropriate working'.

**9.** 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.

**10.** 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.

**11.** Do not penalise the same error twice in the same question.

**12.** Do not penalise a transcription error unless the question has been simplified as a result.

**13.** Where a solution has been scored out and not replaced then provided the solution is legible marks should be awarded in line with the Marking Instructions for that question.

**14.** Where more than one solution is given, mark them all and award the least mark.

**15.** The symbols ✓ and × are used in the Marking Instructions to give guidance regarding the awarding of marks for specific candidate responses to some questions, eg 'award 2/4 ✓××✓' indicates that the 1st & 4th marks should be awarded but the 2nd & 3rd marks should not.

**Part Two: Mathematics Intermediate 1: Paper 1, Units 1, 2 and 3**

| Question | | | Expected Answer/s | Max Mark | Additional Guidance |
|---|---|---|---|---|---|
| **1** | **a** | | **Ans: 20·37**<br>•[1] calculate 6·47 + 13.9: 20·37 | **1** | |
| **1** | **b** | | **Ans: 225**<br>•[1] calculate $^5/_8$ of 360: 225 | **1** | |
| **1** | **c** | | **Ans: 156**<br>•[1] calculate 12 × 13: 156 | **1** | |
| **2** | | | **Ans: 13 hours 35 minutes**<br>•[1] calculate time from 1745 to 0720: 13 hours 35 minutes | **1** | 1. Accept 13.35 |
| **3** | | | **Ans: 25**<br>•[1] know to multiply 4 × (-2) then subtract answer from 17: eg 17 – (-8), 17 + 8<br>•[2] carry out integer multiplication and subtraction correctly: 25 | **2** | 1. Some common answers (no working necessary)<br>(a) 25 award 2/2<br>(b) -26 [13 × (-2)] award 1/2<br>(c) 8 or -8 award 0/2<br>2. Some common answers (**working must be shown)**<br>(a) 17 – 8 = 9 or 17 – 8 award 1/2<br>(b) -8 – 17 = -25 [4 × (-2) −17] award 1/2<br>(c) 8 – 17 = -9 [4 × (-2) −17] award 0/2<br>(d) 17 − 6 = 11 award 0/2<br>(e) 17 + 6 = 23 award 0/2 |

| Question | | | Expected Answer/s | Max Mark | Additional Guidance |
|---|---|---|---|---|---|
| 4 | a | | **Ans: (-7,2) and (5,-6) plotted correctly**<br><br>•[1] (-7,2) **and** (5,-6) plotted correctly: | **1** | 1. Points need not be labelled |
| 4 | b | | **Ans: (-1,-2)**<br><br>•[1] state coordinates of midpoint of PQ: (-1,-2) | **1** | 1. Line PQ need not be drawn<br><br>2. Accept -1,-2 without brackets or (-1), (-2)<br><br>3. Where (2,-7) and (-6,5) are plotted in (a) then accept either (-2,-1) or (-1,-2) in (b) |

| Question | | | Expected Answer/s | Max Mark | Additional Guidance |
|---|---|---|---|---|---|
| 5 | a | | **Ans: £4**<br><br>•[1] know how to find cost of additional distance: 2 × 50(p)<br><br>•[2] correctly add £3 to above: (£)3 + 2 × 50(p) = (£)4 | 2 | 1. (£)4 without working award 2/2<br><br>2. Some common answers **(working must be shown)**<br>(a) 3 × (£)3 + 2 × 50(p) = (£)10 award 1/2<br>(b) (£)3 + 3 × 50(p) = (£)4·50 award 1/2<br>(c) 3 × (£)3 + 3 × 50(p) = (£)10·50 award 0/2<br>(d) (£)3 + 50(p) = (£)3·50 award 0/2 |
| 5 | b | | **Ans: 4500m**<br><br>•[1] know to split £7 into £3 + 8 × 50p<br><br>•[2] calculate distance: 500 + 8 × 500 = 4500 | 2 | 1. 4500 without working award 2/2 (irrespective of answer to (a))<br><br>2. Award 1/2 for these common answers **(working must be shown)**<br>(a) If candidate uses 50p per 500m, then allow **one** 500 less or **one** 500 extra<br>(i) 8 × 500 = 4000<br>(ii) 500 + 7 × 500 = 4000<br>(iii) 500 + 9 × 500 = 5000<br>(b) If candidate uses £1 per 1000m, then allow **one** 1000 less or **one** 1000 extra<br>(i) 4 × 1000 = 4000<br>(ii) 500 + 3 × 1000 = 3500<br>(iii) 500 + 5 × 1000 = 5500<br>(c) If candidate uses £1 per 500m, then £3 + 4 × £1 must be used<br>500 + 4 × 500 = 2500<br><br>3. Where incorrect method is used in part (a), then allow follow through in part (b)<br>(i) (a) = £4·50<br>(b) = 4000 award 2/2 for (b)<br>(ii) (a) = £10·50<br>(b) = 1000 award 1/2 for (b)<br>(iii) (a) = £10<br>(b) = 1071 award 2/2 for (b),<br>(b) = 1000 +500 ÷ 7 award1/2 for (b)<br>(b) = 1000 award 0/2 for (b) |

<table>
<tr><th colspan="3">Question</th><th>Expected Answer/s</th><th>Max Mark</th><th>Additional Guidance</th></tr>
<tr><td>6</td><td></td><td></td><td>Ans: p = 14<br><br>•1 start to collect like terms: 4p or 56<br><br>•2 collect like terms and equate: 4p = 56<br><br>•3 solve equation for p: p = 14</td><td>3</td><td>1. For the award of the 3rd mark an answer of the form ‘p = ’ is required<br><br>2. For answers without valid working eg<br>(i) 4p – 2 = 54 → 56 ÷ 4 → p = 14<br>award 2/3 ✓×✓<br>(ii) p = 14 without working<br>award 1/3 ××✓<br>(iii) 56 ÷ 4 = 14<br>award 1/3 ✓××<br>(iv) 7 × 14 – 2 = 54 + 3 × 14 → p = 14<br>award 1/3 ××✓<br><br>3. Answers acceptable for partial credit (valid working must be shown)<br>(i) 4p = 56 → 14 ✓✓× award 2/3<br>(ii) 4p = 52 → p = 13 ✓×✓ award 2/3<br>(iii) 10p = 56 → p = 5·6 ✓×✓ award 2/3<br>(iv) 10p = 52 → p = 5·2 ××✓ award 1/3</td></tr>
<tr><td>7</td><td>a</td><td></td><td>Ans:<br><table><tr><td>x</td><td>– 2</td><td>0</td><td>3</td></tr><tr><td>y</td><td>–8</td><td>–2</td><td>7</td></tr></table><br>•1 calculate y when $x$ = – 2: –8<br><br>•2 calculate y when $x$ = 0 and 3: –2 and 7</td><td>2</td><td></td></tr>
<tr><td>7</td><td>b</td><td></td><td>Ans: straight line graph of $y = 3x - 2$<br><br>•1 correctly plot all three points from the table<br><br>•2 draw straight line through the three points shown in the table</td><td>2</td><td>1. If the line $y = 3x - 2$ is drawn (even if this is not consistent with the points in the table) award 2/2 [minimum acceptable length: line joining (–1,–5) to (1,1)]<br><br>2. Where the three points plotted are consistent with the table and are not collinear, the 2nd mark is unavailable [Check gradients]<br><br>3. Where $(y,x)$ is consistently plotted, answer should be followed through with the possibility of awarding the 2nd mark</td></tr>
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| Question | | | Expected Answer/s | Max Mark | Additional Guidance |
|---|---|---|---|---|---|
| 8 | a | | **Ans: 15 minutes**<br><br>•1 find mode: 15 | **1** | 1. For an answer of 15<br>(a) without working, award 1/1<br>(b) with evidence of an incorrect method , award 0/1<br>eg 5, 10, 15, 20, 25 [median]<br>75 ÷ 5 = 15 ["mean"] |
| 8 | b | | **Ans:** $^{7}/_{30}$<br><br>•1 find probability: $^{7}/_{30}$ | **1** | 1. Accept 7:30, 7 out of 30, 7 in 30, 7-30, 0·23(3…), 23(·3…)% |
| 8 | c | | **Ans: 16·5**<br><br>•1 complete table: 140<br>125<br>495<br><br>•2 know to divide Σfx by 30:<br>495 ÷ 30<br><br>•3 correctly divide Σfx by 30:<br>= 16·5 | **3** | 1. Award of 1st mark: 140, 125 and 495 need not appear in table but must be shown in working<br><br>2. 2nd mark may only be awarded for attempting $\sum fx \div 30$<br><br>3. <u>**Answer**</u> / <u>**With evidence for 1st mark**</u> / <u>**Without evidence for 1st mark**</u><br>16·5 — 3/3✓✓✓ — 2/3 ×✓✓<br>99 [495 ÷ 5] — 1/3 ✓×× — 0/3<br>495 ÷ 3 × 10 [= 1650] — 2/3 ✓✓× — 1/3 ✓×× |

<table>
<tr><th colspan="3">Question</th><th>Expected Answer/s</th><th>Max Mark</th><th>Additional Guidance</th></tr>
<tr><td>9</td><td></td><td></td><td>Ans:<br>
<table>
<tr><th>105</th><th>80</th><th>55</th><th>50</th><th>30</th><th>Total</th></tr>
<tr><td>✓</td><td></td><td>✓</td><td></td><td>✓</td><td>190</td></tr>
<tr><td>✓</td><td></td><td></td><td>✓</td><td>✓</td><td>185</td></tr>
<tr><td></td><td>✓</td><td>✓</td><td></td><td>✓</td><td>165</td></tr>
<tr><td></td><td>✓</td><td></td><td>✓</td><td>✓</td><td>160</td></tr>
<tr><td></td><td></td><td>✓</td><td>✓</td><td>✓</td><td>135</td></tr>
</table>
$\bullet^1$ complete one row correctly<br>
$\bullet^2$ complete another two rows correctly<br>
$\bullet^3$ complete final two rows correctly</td><td>3</td><td>1. Where there are missing totals a maximum of 2 marks is available<br>(a) 5 rows otherwise “correct” award 2/3<br>(b) 2 rows otherwise “correct” award 1/3</td></tr>
<tr><td>10</td><td>a</td><td></td><td>Ans: 9 or -2<br>$\bullet^1$ find hidden number: 9 or -2</td><td>1</td><td>1. Answer may appear on hidden card</td></tr>
<tr><td>10</td><td>b</td><td></td><td>Ans: 4<br>$\bullet^1$ know that total = mean × 6: $5 \times 6$<br>$\bullet^2$ find hidden number: $30 - (7 + 8 + 2 + 8 + 1) = 4$</td><td>2</td><td>1. 4 without working award 2/2<br>2. (a) $26 \div 6 = 4(\cdot...) = 4$ award 0/2<br>(b) $26 \div 5 = 5(\cdot...)$ then an answer of 4 award 2/2<br>3. Alternative strategy:<br>$\bullet^1$ two trials where second is better than first:<br>$\bullet^2$ find hidden number: 4<br>4. Answer may appear on hidden card</td></tr>
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**TOTAL MARKS FOR PAPER 1**

**30**

[END OF MARKING INSTRUCTIONS]