OCR
RECOGNISING ACHIEVEMENT

GCE

Mathematics (MEI)

Advanced GCE

Unit **4754B:** Applications of Advanced Mathematics: Paper B

Mark Scheme for January 2011

Oxford Cambridge and RSA Examinations

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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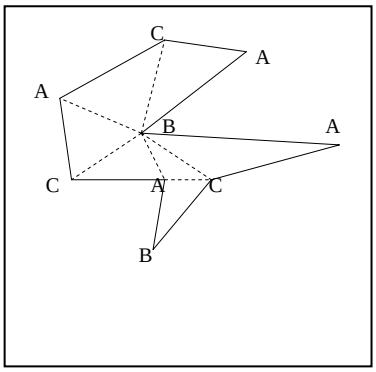
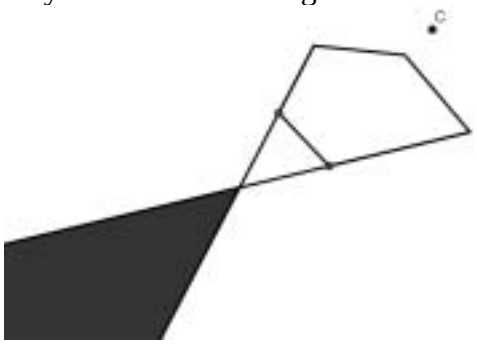
<table>
<tr><td>Qn</td><td>Answer</td><td>Marks</td></tr>
<tr><td>1(i)</td><td>6 correct marks</td><td>B1</td></tr>
<tr><td>1(ii)</td><td>Either state both m and n odd or give a diagram (doorways between rooms not necessary)
justification</td><td>B1

B1ft</td></tr>
<tr><td>2(i)</td><td>$\frac{9-1}{4} = 2 = \left\lfloor \frac{4+1}{2} \right\rfloor$</td><td>B2
(B1 for LHS correct)</td></tr>
<tr><td>2(ii)</td><td><table><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>$\left\lceil \frac{x}{2} \right\rceil$</td><td>1</td><td>1</td><td>2</td><td>2</td><td>3</td></tr></table></td><td>B2,1,0</td></tr>
<tr><td>3.</td><td>If each of A, B and C appeared at least four times then the total number of vertices would have to be at least 3×4=12</td><td>E2</td></tr>
<tr><td>4(i)</td><td> 
</td><td>M1
allow if one error

A1</td></tr>
<tr><td>4(ii)</td><td>Two points labelled B above clearly marked (or f.t. from (i))</td><td>A1</td></tr>
<tr><td>5(i)</td><td>True.
Two cameras at the vertices labelled A or at the vertices labelled B would cover the entire gallery</td><td>A1
M1 for either</td></tr>
<tr><td>5(ii)</td><td>False.
One camera at either vertex labelled A would be sufficient (or C on RHS)</td><td>A1
M1</td></tr>
<tr><td>6</td><td>Anywhere in shaded region
 

correct construction

correct shading</td><td>

M1

A1</td></tr>
</table>

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