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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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### Question 1
- **(a)** 8
- **(b)** Response implying some faces hidden within the large cube
- **(c)** 24

1 bod for ‘can’t see’

1 FT

FT 3 × their (a)

### Question 2
- **(a)** 27
- **(b)** 8
- **(c)** 6

2

If 0 scored, B1 for one correct face
C opportunity

### Question 3
- **(a)** 4 by 4 by 4 cube drawn
- **(b) (i)** 8
- **(b) (ii)** 24

2

### Question 4

<table>
<thead>
<tr>
<th>Size of cube</th>
<th>Total number of small cubes</th>
<th>Number of small cubes with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 crosses</td>
<td>1 cross</td>
</tr>
<tr>
<td>2 by 2 by 2</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>3 by 3 by 3</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>4 by 4 by 4</td>
<td>64</td>
<td>8</td>
</tr>
<tr>
<td>5 by 5 by 5</td>
<td>125</td>
<td>27</td>
</tr>
</tbody>
</table>

B1 for 0 in row 1 column 5
B1 for 8 in row 1 column 6
B1 for 125 in row 4 column 2
B1 for 36 in row 4 column 5
### 5 (a)
- 1 small cube with 0 crosses gives 0 crosses
- 6 small cubes with 1 cross gives 6 crosses
- 12 small cubes with 2 crosses gives 24 crosses
- 8 small cubes with 3 crosses gives 24 crosses
- Total = 54 crosses

### 5 (b)
- 9
- 54

### 5 (c)
- 96

### 6 (a)
- \((n - 2)^3\) oe isw

### 6 (b)
- \(6(n - 1)^2\) oe isw

### 6 (c)
- \(12(n - 1)\) oe isw

### Communication in two of 3(a), 5(c), 6(a), 6(b) or 6(c)

- **B1** for either 24
- **1 FT** for their \(9 \times 6\)
- **C opportunity**

- **B1** for \([kn] - 2\)
- **Or B1** for \(n^3\) soi
- **C opportunity**

- **Accept \(6(n - 2)^3\)**
- **from cubes**
- **C opportunity**

- **12(n – 2)** from cubes
- **C opportunity**

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