



**Coimisiún na Scrúduithe Stáit**  
State Examinations Commission

**Junior Certificate 2018**

**Marking Scheme**

**Mathematics**

**Foundation Level**

## **Note to teachers and students on the use of published marking schemes**

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

## **Future Marking Schemes**

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

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## Structure of the marking scheme

Candidate responses are marked according to different scales, depending on the types of response anticipated. Scales labelled A divide candidate responses into two categories (correct and incorrect), scales labelled B divide responses into three categories (correct, partially correct, and incorrect), and so on. The scales and the marks that they generate are summarised in this table:

Scale label	B	C	D
No of categories	3	4	5
5-mark scale	0, 2, 5	0, 2, 3, 5	
10-mark scale	0, 5, 10	0, 4, 8, 10	0, 4, 6, 8, 10
15-mark scale		0, 5, 10, 15	0, 4, 8, 12, 15

A general descriptor of each point on each scale is given below. More specific directions in relation to interpreting the scales in the context of each question are given in the scheme, where necessary.

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### Marking scales – level descriptors

#### B-scales (three categories)

- response of no substantial merit (no credit)
- partially correct response (partial credit)
- correct response (full credit)

#### C-scales (four categories)

- response of no substantial merit (no credit)
- response with some merit (low partial credit)
- almost correct response (high partial credit)
- correct response (full credit)

#### D-scales (five categories)

- response of no substantial merit (no credit)
- response with some merit (low partial credit)
- response about half-right (mid partial credit)
- almost correct response (high partial credit)
- correct response (full credit)

In certain cases, typically involving incorrect rounding, omission of units, a misreading that does not oversimplify the work, or an arithmetical error that does not oversimplify the work, a mark that is one mark below the full-credit mark may be awarded. This level of credit is referred to as *Full Credit –1*, and these types of errors are identified with an asterisk (\*). Thus, for example, in Scale 10C, *Full Credit –1* of 9 marks may be awarded.

No marks may be awarded other than those on the appropriate scale, and *Full Credit –1*.

### Summary of mark allocations and scales to be applied

**Question 1 (25)**

- (a) 15C
- (b) 10D

**Question 2 (25)**

- (a) 10B
- (b) 5B
- (c) 10C

**Question 3 (15)**

- (a) 10C
- (b) 5B

**Question 4 (25)**

- (a) 10D
- (b), (c) 10D
- (d) 5B

**Question 5 (25)**

- (a) 15C
- (b), (c) 10D

**Question 6 (15)**

- (a), (b), (c) 15D

**Question 7 (15)**

- (a), (b) 5B
- (c) 10C

**Question 8 (10)**

- 10D

**Question 9 (20)**

- (a) 10B
- (b) 10C

**Question 10 (35)**

- (a), (b) 10D
- (c) 5B
- (d), (e), (f) 15D
- (g) 5C

**Question 11 (20)**

- (a) 10C
- (b) 10C

**Question 12 (15)**

- 15D

**Question 13 (35)**

- (a) 10C
- (b), (c) 15D
- (d), (e) 10C

**Question 14 (20)**

- (a), (b) 5C
- (c) 5C
- (d) 10D

## Model Solutions & Marking Notes

The model solutions for each question are not intended to be exhaustive – there may be other correct solutions. Any Examiner unsure of the validity of the approach adopted by a particular candidate to a particular question should contact his / her Advising Examiner.

Where the scheme refers to “work of merit”, examples are given of the standard acceptable as work of merit in that particular part.

In general, accept a candidate’s work in one part of a question for use in subsequent parts of the question, unless this oversimplifies the work involved.

Q1	Model Solution – 25 Marks	Marking Notes
(a)	(i) 79 (ii) 148 (iii) $25 \cdot 2$ or $25 \frac{1}{5}$ or $\frac{126}{5}$	<b>Scale 15C (0, 5, 10, 15)</b> Accept correct answers without work <i>Low Partial Credit</i> • 1 part correct <i>High Partial Credit</i> • 2 parts correct
(b)	Thermometer A: 25 [°C] $25 - 7 = 18$ [°C]  Thermometer B: -4 [°C] $-4 + 10 = 6$ [°C]	<b>Scale 10D (0, 4, 6, 8, 10)</b> Accept correct answers without work Accept correct answers without units Tolerance of $\pm 1^\circ$ in reading temperatures <i>Low Partial Credit</i> • 1 temperature correct <i>Mid Partial Credit</i> • 2 temperatures correct <i>High Partial Credit</i> • 3 temperatures correct

Q2	Model Solution – 25 Marks	Marking Notes
(a)	Answer: B Reason: Spinner B has the largest white sector.  <i>or any other valid reason</i>	<b>Scale 10B (0, 5, 10)</b> <i>Partial Credit</i> • Answer correct • Work of merit in reason, for example: shows understanding of the connection between size of sector and probability.

Q2	Model Solution – 25 Marks	Marking Notes								
(b)	$\frac{1}{2} \times 80 = 40$	<p><b>Scale 5B (0, 2, 5)</b></p> <p>Accept correct answer without work Accept answers such as “around 40”</p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit, for example: indicates <math>\frac{1}{2}</math>; or multiplies by 80</li> </ul>								
(c)	<table border="1"> <tbody> <tr> <td>WWW</td> <td>WWG</td> <td>WGW</td> <td>WGG</td> </tr> <tr> <td>GWW</td> <td>GWG</td> <td>GGW</td> <td>GGG</td> </tr> </tbody> </table>	WWW	WWG	WGW	WGG	GWW	GWG	GGW	GGG	<p><b>Scale 10C (0, 4, 8, 10)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 entry correct</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 4 entries correct</li> </ul>
WWW	WWG	WGW	WGG							
GWW	GWG	GGW	GGG							

Q3	Model Solution – 15 Marks	Marking Notes
(a)	B E A D	<p><b>Scale 10C (0, 4, 8, 10)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 entry correct</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 entries correct</li> </ul>
(b)	Getting tails when you toss a coin  <i>or any other valid event</i>	<p><b>Scale 5B (0, 2, 5)</b></p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit, for example: mentions a 50-50 chance</li> </ul>

Q4	Model Solution – 25 Marks	Marking Notes																																			
(a)	<table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="border-right: 1px solid black; width: 20px;">1</td> <td style="width: 20px;">8</td> <td style="width: 20px;">8</td> <td style="width: 20px;">9</td> <td style="width: 20px;">9</td> <td style="width: 20px;">9</td> <td style="width: 20px;"></td> </tr> <tr> <td style="border-right: 1px solid black;">2</td> <td>3</td> <td>4</td> <td>6</td> <td>6</td> <td>8</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black;">3</td> <td>1</td> <td>2</td> <td>3</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="border-right: 1px solid black;">4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="border-right: 1px solid black;">5</td> <td>9</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	1	8	8	9	9	9		2	3	4	6	6	8		3	1	2	3				4							5	9						<p><b>Scale 10D (0, 4, 6, 8, 10)</b></p> <p>Accept diagram with unordered entries</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>Work of merit, for example: <ul style="list-style-type: none"> <li>1 correct entry;</li> <li>or 1 correct entry with stem rewritten</li> </ul> </li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>5 correct entries</li> <li>10 correct entries, but rewrites stem for each entry</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>10 correct entries</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>Apply a * if just 1 entry is omitted or incorrect (including having stem rewritten)</li> </ul>
1	8	8	9	9	9																																
2	3	4	6	6	8																																
3	1	2	3																																		
4																																					
5	9																																				
(b), (c)	<p>(b) 19 [texts]</p> <p>(c) <math>\frac{14}{2} = 7</math>, median is 7 · 5th term  Median = <math>\frac{24+26}{2} = \frac{50}{2} = 25</math>  [texts]</p>	<p><b>Scale 10D (0, 4, 6, 8, 10)</b></p> <p>Accept correct answers without work</p> <p>Accept correct answers without units</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>Work of merit, for example: <ul style="list-style-type: none"> <li>finds an incorrect measure of centre;</li> <li>in (b), gives 9 as the answer;</li> <li>in (c), mentions 7th or middle;</li> <li>or answer of 24 or 26</li> </ul> </li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>(b) correct</li> <li>Work of merit in (b) <b>and</b> (c)</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>(c) correct</li> <li>(b) correct <b>and</b> work of merit in (c)</li> </ul>																																			
(d)	<p>Answer: 59 [texts]</p> <p>Reason: As this is the day he sent the most texts when he was organising the party.</p> <p><i>or any other valid reason</i></p>	<p><b>Scale 5B (0, 2, 5)</b></p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>Answer from the table without a valid reason</li> </ul>																																			

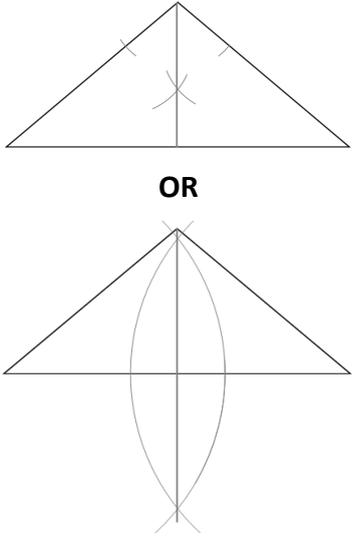
Q5	Model Solution – 25 Marks	Marking Notes
(a)	[€] 2 [€] 4 [€] 5 [€] 2 [€] 2  Total = 2 + 4 + 5 + 2 + 2 = [€] 15	<b>Scale 15C (0, 5, 10, 15)</b> Accept correct answers without units Incorrect rounding in (a) is not correct (i.e. do not apply a * for this) <i>Low Partial Credit</i> <ul style="list-style-type: none"> <li>One entry correct</li> </ul> <i>High Partial Credit</i> <ul style="list-style-type: none"> <li>Four entries correct</li> </ul>
(b), (c)	(b) €15 · 04  (c) $20 - 18 \cdot 03 = 1 \cdot 97$ , which rounds to [€] 1 · 95 OR 18 · 03 rounds to 18 · 05 $20 - 18 \cdot 05 = [€] 1 \cdot 95$	<b>Scale 10D (0, 4, 6, 8, 10)</b> Incorrect rounding in (c) merits at most work of merit in this part (i.e. do not apply a * for this) <i>Low Partial Credit</i> <ul style="list-style-type: none"> <li>Work of merit, for example:                in (b), adds some relevant figures;                in (c), subtracts some figure from €20;                or <math>-15 \cdot 04</math></li> </ul> <i>Mid Partial Credit</i> <ul style="list-style-type: none"> <li>Work of merit in (b) <b>and</b> (c)</li> <li>(b) <b>or</b> (c) correct</li> </ul> <i>High Partial Credit</i> <ul style="list-style-type: none"> <li>(b) <b>or</b> (c) correct, <b>and</b> work of merit in the other part</li> </ul>

Q6	Model Solution – 15 Marks	Marking Notes
(a), (b), (c)	(a) [€] 84  (b) $84 - 65 = [€] 19$  (c) $420 - 19 = [€] 401$	<b>Scale 15D (0, 4, 8, 12, 15)</b> Accept correct answers without work Accept correct answers without units. <i>Low Partial Credit</i> <ul style="list-style-type: none"> <li>(a) correct</li> <li>Work of merit in (a) <b>or</b> (b) <b>or</b> (c), for example:                use of relevant numbers or operation</li> </ul> <i>Mid Partial Credit</i> <ul style="list-style-type: none"> <li>(a) correct <b>and</b> work of merit in (b) <b>or</b> (c)</li> <li>(b) <b>or</b> (c) correct</li> <li>Work of merit in (b) <b>and</b> (c)</li> </ul> <i>High Partial Credit</i> <ul style="list-style-type: none"> <li>2 parts correct</li> <li>(a) correct <b>and</b> work of merit in (b) <b>and</b> (c)</li> </ul>

Q7	Model Solution – 15 Marks	Marking Notes
(a), (b)	(a) Venn Diagram  (b) $A \cap B$	<b>Scale 5B (0, 2, 5)</b> <i>Partial Credit</i> • (a) or (b) correct
(c)	$B = \{3, 6, 7, 9\}$	<b>Scale 10C (0, 4, 8, 10)</b> Ignore repeated elements. Award at most <i>HPC</i> if incorrect elements are present. <i>Low Partial Credit</i> • 1 element correct • $B'$ (the complement of B) correct, {1, 4, 5} <i>High Partial Credit</i> • 3 elements correct

Q8	Model Solution – 10 Marks	Marking Notes
	180 4 [th] 6 [th]	<b>Scale 10D (0, 4, 6, 8, 10)</b> Tolerance of $\pm 20$ for the first entry Accept correct answers without units <i>Low Partial Credit</i> • Work of merit, for example: relevant indication on graph, or 7 <sup>th</sup> for the second entry <i>Mid Partial Credit</i> • 1 entry correct <i>High Partial Credit</i> • 2 entries correct

Q9	Model Solution – 20 Marks	Marking Notes
(a)	B A or C	<b>Scale 10B (0, 5, 10)</b> <i>Partial Credit</i> • Sentence 1 or sentence 2 correct

Q9	Model Solution – 20 Marks	Marking Notes
(b)		<p><b>Scale 10C (0, 4, 8, 10)</b> Tolerance of <math>5^\circ</math> if angle is bisected, or <math>\pm 0.5</math> cm if side is bisected.</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Axis drawn without construction arcs</li> <li>• One correct relevant construction arc drawn</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Correctly bisects the incorrect angle or side</li> <li>• All necessary construction arcs correct, but bisector outside of tolerance or not present</li> </ul>

Q10	Model Solution – 35 Marks	Marking Notes
(a), (b)	<p>(a) <math>D</math> plotted and labelled correctly</p> <p>(b) <math>A = (6, 2)</math> <math>B = (8, 4)</math></p>	<p><b>Scale 10D (0, 4, 6, 8, 10)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 ordinate correctly written or plotted (including if co-ordinates reversed)</li> <li>• Multiple points plotted but not labelled, and one of these points is at (4, 9)</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 point correctly written or plotted</li> <li>• 2 points correctly written or plotted with co-ordinates reversed</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 points correctly written or plotted</li> <li>• All points correctly written or plotted with co-ordinates reversed</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• Apply a * if the point <math>D</math> is not labelled (as long as it is still clearly the answer to part (a))</li> </ul>
(c)	$\left(\frac{6+8}{2}, \frac{2+4}{2}\right) = \left(\frac{14}{2}, \frac{6}{2}\right) = (7, 3)$	<p><b>Scale 5B (0, 2, 5)</b></p> <p>Accept correct answers without work</p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit, for example: midpoint indicated on diagram; or correct midpoint formula; or slope or distance found; or 1 ordinate correct (7 or 3); or co-ordinates correct but reversed</li> </ul>

Q10	Model Solution – 35 Marks	Marking Notes
(d), (e), (f)	(d) Height = 4 [cm] Width = 2 [cm]  (e) $4 \times 2 = 8$ [cm <sup>2</sup> ]  (f) Actual Height = $4 \times 0.5 = 2$ [m] Actual Width = $2 \times 0.5 = 1$ [m]	<p><b>Scale 15D (0, 4, 8, 12, 15)</b></p> <p>Accept correct answers without work            Accept correct answers without units            Tolerance for (d): less than <math>\pm 0.5</math> cm</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit in (d), for example: 1 value correct; or correct values reversed</li> <li>• Work of merit in (e), for example: correct area formula; or finds perimeter or semi-perimeter</li> <li>• Work of merit in (f), for example: 1 value correct; or actual height given as twice value of height</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 part correct</li> <li>• Work of merit in 2 parts</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 parts correct</li> </ul>
(g)	$170 \div 100 = 1.7$ , so need 2 tins $2 \times \text{€}42.50 = \text{€}85$	<p><b>Scale 5C (0, 2, 3, 5)</b></p> <p>Accept correct answer without unit.            Accept correct answer without work.</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit, for example: relevant operation</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Mishandles rounding, otherwise correct (<math>1.7 \times 42.50 = 72.25</math>)</li> </ul>

Q11	Model Solution – 20 Marks	Marking Notes
(a)	$t + 9t + 6c - 2c$ $= 10t + 4c$	<p><b>Scale 10C (0, 4, 8, 10)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>Indicates grouping of relevant terms</li> <li>1 correct coefficient</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>1 correct term</li> </ul>
(b)	$4b = 500 - 280$ $4b = 220$ $b = \frac{220}{4} = 55$	<p><b>Scale 10C (0, 4, 8, 10)</b></p> <p>Accept <math>4(55) + 280 = 500</math> for Full Credit</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>Substitutes an incorrect value for <math>b</math></li> <li>Shows understanding of solving equations (for example: <math>4b = 500 + 280</math>)</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li><math>4b = 220</math></li> <li>Transposition error and finished correctly</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li><math>\frac{220}{4}</math></li> </ul>

Q12	Model Solution – 15 Marks	Marking Notes
	<ol style="list-style-type: none"> <li><math>5b</math></li> <li><math>2b + 6a</math></li> <li>The cost of an apple and two bananas</li> <li><math>20 - 5b</math></li> </ol>	<p><b>Scale 15D (0, 4, 8, 12, 15)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>Some work of merit, for example: 1 correct term</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>2 parts correct</li> <li>Work of merit in all 4 parts</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>3 parts correct</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>Apply a * if “cost” is omitted from 3.</li> </ul>

Q13	Model Solution – 35 Marks	Marking Notes
(a)	100, 80, 60	<p><b>Scale 10C (0, 4, 8, 10)</b> Accept correct answers without work</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 entry correct</li> <li>• Linear pattern produced</li> <li>• Indicates “–20” or similar</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 entries correct</li> </ul>
(b), (c)	<p>(b) 3 points plotted correctly</p> <p>(c) Day 6: 40 ml Day 7: 20 ml Day 8: 0 ml</p> <p>Answer: 8 [days]</p>	<p><b>Scale 15D (0, 4, 8, 12, 15)</b> Accept correct points with line joining them in (b). Accept correct answer without work in (b). In (c), accept “3 days” with supporting work.</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit, for example: in (b), 1 point plotted correctly; or 3 points plotted in a linear pattern; in (c), continues linear sequence from table; or line continued on graph</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (b) <b>or</b> (c) correct</li> <li>• Work of merit in (b) <b>and</b> (c)</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (b) <b>or</b> (c) correct <b>and</b> work of merit in the other part</li> <li>• (b) <b>and</b> (c) correct but no work for (c)</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• (b) correct <b>and</b> answer of “6 days” in (c) with valid supporting work</li> </ul>
(d), (e)	<p>(d) It goes down by the same amount each day</p> <p><i>or any other valid explanation</i></p> <p>(e) <math>160 - 20d</math></p>	<p><b>Scale 10C (0,4, 8, 10)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit, for example: in (d) <b>or</b> (e) shows some knowledge of linear sequences</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (d) <b>or</b> (e) correct</li> <li>• Work of merit in (d) <b>and</b> (e)</li> </ul>

Q14	Model Solution – 20 Marks	Marking Notes
(a), (b)	(a) right-angled  (b) $Y = 180^\circ - (90^\circ + 27^\circ)$ $= 180^\circ - 117^\circ$ $= 63^\circ$	<b>Scale 5C (0, 2, 3, 5)</b> Accept correct answer without work Accept correct answer without unit <i>Low Partial Credit</i> <ul style="list-style-type: none"> <li>(a) correct</li> <li>Work of merit in (b), for example: mentions 180; or indicates a relevant operation; or measures angle in diagram (<math>59^\circ</math> or <math>121^\circ</math>, with a tolerance of <math>\pm 3^\circ</math>), or <math>117^\circ</math> or <math>153^\circ</math>, without work.</li> </ul> <i>High Partial Credit</i> <ul style="list-style-type: none"> <li>(a) correct <b>and</b> work of merit in (b)</li> <li>(b) correct</li> </ul>
(c)	$x^2 = 4^2 + 2^2$ $x^2 = 16 + 4 = 20$ $x = \sqrt{20} = 4.47 \dots$ $x = 4.5 \text{ [m] [1 DP]}$	<b>Scale 5C (0, 2, 3, 5)</b> Accept correct answer without unit <i>Low Partial Credit</i> <ul style="list-style-type: none"> <li>Work of merit, for example: Theorem of Pythagoras stated correctly; or indicates <math>4^2</math> or 16 or <math>2^2</math></li> </ul> <i>High Partial Credit</i> <ul style="list-style-type: none"> <li>Correct answer without work</li> <li><math>\sqrt{4^2 + 2^2}</math> or <math>x^2 = 20</math></li> </ul> <i>Full Credit –1</i> <ul style="list-style-type: none"> <li>Apply a * if no or incorrect rounding, or if answer left as <math>\sqrt{20}</math></li> </ul>

Q14	Model Solution – 20 Marks	Marking Notes
(d)	(i) 400 [cm]  (ii) $\pi \times (6)^2 \times 400$ $= 14\,400\pi$ [cm <sup>3</sup> ]	<p><b>Scale 10D (0, 4, 6, 8, 10)</b></p> <p>Accept correct answers without units            Accept correct answers without work</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit, for example:              in (i), multiples or divides by a power of 10;              in (ii), some correct substitution into formula</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (i) correct</li> <li>• Work of merit in (i) <b>and</b> (ii)</li> <li>• Substantial work of merit in (ii), for example:              mishandles squaring, otherwise correct;              swaps <math>r</math> and <math>h</math>, otherwise correct</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (ii) correct</li> <li>• (i) correct <b>and</b> work of merit in (ii)</li> <li>• Work of merit in (i) <b>and</b> substantial work of merit in (ii)</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• Apply a * if the answer is not given in terms of <math>\pi</math>, or if <math>\pi</math> is omitted from the answer</li> </ul>

## Marcanna Breise as ucht freagairt trí Ghaeilge

Léiríonn an tábla thíos an méid marcanna breise ba chóir a bhronnadh ar iarrthóirí a ghnóthaíonn níos mó ná 75% d'iomlán na marcanna.

N.B. Ba chóir marcanna de réir an ghnáthráta a bhronnadh ar iarrthóirí nach ngnóthaíonn níos mó ná 75% d'iomlán na marcanna don scrúdú. Ba chóir freisin an marc bóonais sin a **shlánú síos**.

### Tábla 300 @ 5%

Bain úsáid as an tábla seo i gcás na n-ábhar a bhfuil 300 marc san iomlán ag gabháil leo agus inarb é 5% gnáthráta an bhónais.

Bain úsáid as an ngnáthráta i gcás 225 marc agus faoina bhun sin. Os cionn an mharc sin, féach an tábla thíos.

Bunmharc	Marc Bónais
226	11
227 - 233	10
234 - 240	9
241 - 246	8
247 - 253	7
254 - 260	6

Bunmharc	Marc Bónais
261 - 266	5
267 - 273	4
274 - 280	3
281 - 286	2
287 - 293	1
294 - 300	0