



**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**

**Junior Certificate 2016**

**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, 3, 5  | 0, 2, 4, 5   |                 |
| 10-mark scale    | 0, 5, 10 | 0, 4, 8, 10  | 0, 3, 6, 8, 10  |
| 15-mark scale    |          | 0, 5, 12, 15 | 0, 4, 8, 13, 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.

### 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*. 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*.

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.

## Summary of mark allocations and scales to be applied

### Question 1 (30)

- (a)(i)–(iii) 15C
- (b)&(c) 15D

### Question 2 (30)

- (a) 10D
- (b)(i) 10C
- (b)(ii) 10C

### Question 3 (15)

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

### Question 4 (15)

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

### Question 5 (30)

- (a)(i) 5C
- (a)(ii) 5B
- (b) 15C
- (c) 5B

### Question 6 (20)

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

### Question 7 (30)

- (a) 15C
- (b) 5B
- (c)&(d) 10C

### Question 8 (35)

- (a) 15D
- (b) 5B
- (c)&(d) 10C
- (e) 5B

### Question 9 (20)

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

### Question 10 (15)

- (a)&(c) 10D
- (b) 5C

### Question 11 (15)

- (a)&(b) 15D

### Question 12 (10)

10D

### Question 13 (15)

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

### Question 14 (10)

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

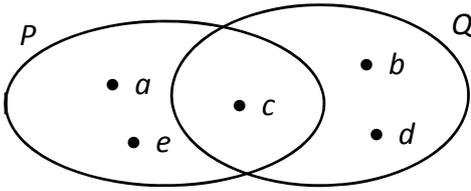
### Question 15 (10)

- (a)&(b) 10D

## Model Solutions & Marking Notes

Note: 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.

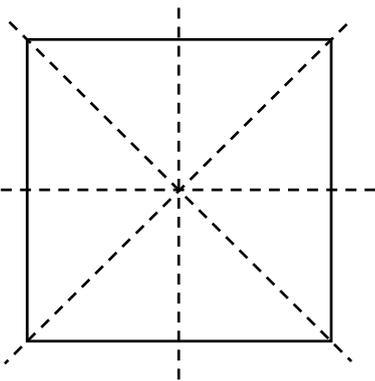
| Q1      | Model Solution – 30 Marks                                   | Marking Notes   |
|---------|---|---|
| (a)     | (i) 18<br>(ii) 24<br>(iii) 32                               | <p><b>Scale 15C (0, 5, 12, 15)</b></p> <p>Accept correct answers without supporting work</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 part correct</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 parts correct</li> </ul>  |
| (b)&(c) | (b)(i) 6<br>(b)(ii) $4 \times 8 = 32$<br>(c) $\frac{1}{20}$ | <p><b>Scale 15D (0, 4, 8, 13, 15)</b></p> <p>Accept (c) as a decimal</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 rounding correct</li> <li>• Multiplication correct</li> <li>• 6.1 rounded to 7, or 3.8 rounded to 3, or 8.2 rounded to 9</li> <li>• 31.16 without supporting work</li> <li>• Work of merit in (c), e.g. numerator or denominator correct</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 3 roundings correct in (b)</li> <li>• 1 rounding <b>and</b> multiplication correct in (b)</li> <li>• (c) correct</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (b) correct</li> <li>• (c) correct <b>and</b> some part of (b) correct</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• Do <b>not</b> award <i>Full Credit –1</i> if there is a rounding error in part (b); award at most <i>High Partial Credit</i></li> </ul> |

| Q2      | Model Solution – 30 Marks   | Marking Notes  |
|---------|---|--|
| (a)     | (i) { 1, 2, 3, 4, 5, 6 }<br>(ii) { 2, 3, 5, 7 }                                   | <b>Scale 10D (0, 3, 6, 8, 10)</b><br><i>Low Partial Credit</i><br><ul style="list-style-type: none"> <li>• 1 element correct in (i)</li> </ul> <i>Mid Partial Credit</i><br><ul style="list-style-type: none"> <li>• (i) correct</li> <li>• 1 element correct in (ii)</li> </ul> <i>High Partial Credit</i><br><ul style="list-style-type: none"> <li>• (ii) correct</li> <li>• (i) correct <b>and</b> 1 element of (ii) correct</li> </ul>  |
| (b)(i)  |  | <b>Scale 10C (0, 4, 8, 10)</b><br><i>Low Partial Credit</i><br><ul style="list-style-type: none"> <li>• 1 element in correct region</li> </ul> <i>High Partial Credit</i><br><ul style="list-style-type: none"> <li>• 2 regions correct</li> </ul>   |
| (b)(ii) | $P \cap Q: c$<br>$P \setminus Q: a, e$  | <b>Scale 10C (0, 4, 8, 10)</b><br>Accept answers based on the given sets or on candidate's incorrect Venn Diagram<br><i>Low Partial Credit</i><br><ul style="list-style-type: none"> <li>• Work of merit in <b>one</b> part, e.g. 1 element correct in either part, or lists <math>Q \setminus P</math> instead of <math>P \setminus Q</math></li> </ul> <i>High Partial Credit</i><br><ul style="list-style-type: none"> <li>• 1 part correct</li> <li>• Work of merit in both parts</li> </ul> |

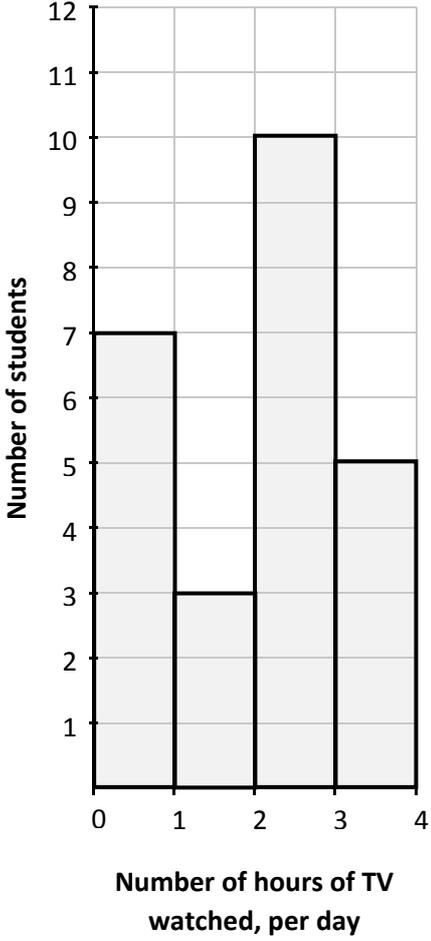
| Q3  | Model Solution – 15 Marks | Marking Notes  |
|-----|---------------------------|--|
| (a) | 45<br>55<br>65<br>75      | <b>Scale 10C (0, 4, 8, 10)</b><br>Accept correct answers without supporting work<br><i>Low Partial Credit</i><br><ul style="list-style-type: none"> <li>• 1 entry correct</li> <li>• Linear pattern produced</li> <li>• Indicates "+10"</li> </ul> <i>High Partial Credit</i><br><ul style="list-style-type: none"> <li>• 3 entries correct</li> </ul> |

| Q3  | Model Solution – 15 Marks | Marking Notes  |
|-----|---------------------------|--|
| (b) | 8                         | <p><b>Scale 5B (0, 3, 5)</b></p> <p>Accept correct answer without supporting work.</p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Continues linear sequence from table</li> <li>• 9 without supporting work</li> <li>• 7 or more, but less than 8, e.g. 7 weeks 4 days, or 7½ weeks</li> <li>• 2 or more, but less than 3, e.g. 2 weeks 4 days, or 2½ weeks</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• Answers “after how many <i>more</i> weeks...”, i.e. answer of 3</li> </ul> |

| Q4  | Model Solution – 15 Marks   | Marking Notes  |
|-----|---|--|
| (a) | $x = 180 - (54 + 54)$ $= 180 - 108$ $= 72$  | <p><b>Scale 10C (0, 4, 8, 10)</b></p> <p>Accept correct answer without supporting work</p> <p>Unit not required</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Measures angle from diagram, i.e. 52° or 128°. Tolerance <math>\pm 5^\circ</math></li> <li>• Mentions 180</li> <li>• One relevant operation indicated or carried out</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Indicates 3 angles sum to 180</li> <li>• <math>180 - 54 = 126</math></li> </ul> |
| (b) | <p><i>Type:</i> Isosceles</p> <p><i>Reason:</i> Two sides are the same <b>or</b> Two angles are the same <i>or equivalent</i></p> | <p><b>Scale 5B (0, 3, 5)</b></p> <p>Accept answer consistent with candidate’s work in (a)</p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Answer <b>or</b> reason correct</li> </ul>   |

| Q5      | Model Solution – 30 Marks   | Marking Notes   |
|---------|---|---|
| (a)(i)  | One of:  | <b>Scale 5C (0, 2, 4, 5)</b><br>Tolerance $\pm 0.5\text{cm}$<br>Accept multiple axes drawn for <i>Full Credit</i> , as long as no incorrect axes are drawn.<br><i>Low Partial Credit</i> <ul style="list-style-type: none"> <li>• Axis drawn outside of tolerance</li> </ul> <i>High Partial Credit</i> <ul style="list-style-type: none"> <li>• 1 correct axis and 1 or more incorrect axes drawn</li> </ul>   |
| (a)(ii) | 4   | <b>Scale 5B (0, 3, 5)</b><br><i>Partial Credit</i> <ul style="list-style-type: none"> <li>• Answer of 2</li> </ul>  |
| (b)     | (i) $25 \times 35 = 875 \text{ cm}^2$<br>(ii) $25 + 35 + 25 + 35 = 120 \text{ cm}$        | <b>Scale 15C (0, 5, 12, 15)</b><br>Accept correct answers without supporting work<br>Accept correct answers without units<br><i>Low Partial Credit</i> <ul style="list-style-type: none"> <li>• Relevant operation indicated in 1 part</li> <li>• Perimeter found in (i) <b>or</b> area found in (ii)</li> <li>• In (b)(ii): 50 or 60 or 70 without supporting work</li> </ul> <i>High Partial Credit</i> <ul style="list-style-type: none"> <li>• 1 part correct</li> <li>• Perimeter found in (i) <b>and</b> area found in (ii)</li> </ul> <i>Full Credit –1</i> <ul style="list-style-type: none"> <li>• (i) correct and “<math>25 + 35 + 25 + 35</math>” indicated, but finished incorrectly in (ii)</li> </ul> |
| (c)     | $20 \times 6 \times 30 = 3600 \text{ cm}^3$   | <b>Scale 5B (0, 3, 5)</b><br>Accept correct answer without supporting work<br>Accept correct answer without unit<br><i>Partial Credit</i> <ul style="list-style-type: none"> <li>• Relevant operation indicated</li> <li>• 56 or 120 or 180 or 600 without supporting work.</li> </ul>  |

| Q6      | Model Solution – 20 Marks  | Marking Notes  |
|---------|--|--|
| (a)     | $28 \times 5.30 = \text{€}148.40$  | <p><b>Scale 10B (0, 5, 10)</b></p> <p>Accept correct answer without supporting work</p> <p>Accept correct answer without unit</p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Indicates multiplication by 28 or 5.30</li> <li>• Indicates addition of 5.30 and 5.30</li> </ul>   |
| (b)&(c) | <p>(b) <math>0.15 \times 148.40 = \text{€}22.26</math></p> <p>(c) <math>\text{€}148.40 - \text{€}22.26 = \text{€}126.14</math></p> | <p><b>Scale 10C (0, 4, 8, 10)</b></p> <p>Accept correct answers without supporting work</p> <p>Accept correct answers without unit</p> <p>Table in (c) does not need to be filled in</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit in (b), e.g. shows understanding of percentages</li> <li>• Correct subtraction in (c), where (b) is incorrect</li> <li>• <math>\text{€}148.40 - 15\% = 148.25</math></li> <li>• <math>\text{€}5.30 - 15\% = 5.15</math></li> <li>• <math>\text{€}5.30 - 15\% = 4.505</math></li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (b) correct</li> <li>• Correct discount on 1 costume, i.e. <math>\text{€}0.795</math></li> <li>• <math>\text{€}148.40 - 0.795 = 147.605</math> or <math>147.60</math> or <math>147.61</math></li> <li>• <math>\text{€}148.40 - 15\% = 126.14</math>, i.e. where discount has not been written down</li> </ul> |

| Q7      | Model Solution – 30 Marks  | Marking Notes   |
|---------|--|---|
| (a)     |  <p style="text-align: center;">Number of hours of TV watched, per day</p>                           | <p><b>Scale 15C (0, 5, 12, 15)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 bar drawn, correct or incorrect</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 bars correct</li> <li>• Incorrect graph drawn correctly</li> </ul>   |
| (b)     | $10 + 5 = 15$  | <p><b>Scale 5B (0, 3, 5)</b></p> <p>Accept answer consistent with table or graph</p> <p>Accept correct answer without supporting work</p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Correct values or bars indicated</li> <li>• <math>7 + 3</math></li> <li>• 18 without supporting work</li> </ul>   |
| (c)&(d) | <p>(c) Categorical<br/>They are not numbers<br/>or any other valid reason</p> <p>(d) Include “other” or<br/>“Ask: How do you usually travel...”<br/>or any other valid improvement</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 in (c) <b>or</b> (d),<br/>e.g. answer <b>or</b> reason correct in (c), <b>or</b><br/>weakness of question identified in (d)</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (c) <b>or</b> (d) correct</li> <li>• Work of merit in (c) <b>and</b> (d)</li> </ul> |

| Q8      | Model Solution – 35 Marks   | Marking Notes   |    |    |    |    |    |    |    |    |  |    |    |  |
|---------|---|---|----|----|----|----|----|----|----|----|--|----|----|--|
| (a)     | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td>H3</td> <td>H4</td> <td>H5</td> <td>H6</td> </tr> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td style="background-color: #cccccc;"></td> <td>T5</td> <td>T6</td> </tr> </table> |   |    | H3 | H4 | H5 | H6 | T1 | T2 | T3 |  | T5 | T6 | <p><b>Scale 15D (0, 4, 8, 13, 15)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>1 aspect of 1 entry correct (i.e. the number on the die <b>or</b> the face on the coin)</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>1 entry correct</li> <li>4 entries with 1 aspect correct</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>4 entries correct</li> <li>1 aspect of each entry correct</li> </ul> |
|         |   | H3  | H4 | H5 | H6 |    |    |    |    |    |  |    |    |  |
| T1      | T2  | T3  |    | T5 | T6 |    |    |    |    |    |  |    |    |  |
| (b)     | 12  | <p><b>Scale 5B (0, 3, 5)</b></p> <p>Accept correct answer without supporting work</p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>2 or 6 or 8 without supporting work</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>Excludes the given entries, i.e. answer of 9</li> </ul>  |    |    |    |    |    |    |    |    |  |    |    |  |
| (c)&(d) | <p>(c) <math>\frac{1}{12}</math> <b>or</b> 0.083...</p> <p>(d) <math>\frac{3}{12}</math> <b>or</b> <math>\frac{1}{4}</math> <b>or</b> 0.25</p>  | <p><b>Scale 10C (0, 4, 8, 10)</b></p> <p>Accept correct answers without supporting work</p> <p>Accept 0.08 or more accurate in (c)</p> <p>Accept candidate's incorrect total from (b) instead of 12</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>1 aspect (numerator <b>or</b> denominator) correct in (c) <b>or</b> (d)</li> <li>2 or 4 or 6 or T2 or T4 or T6 listed in (d)</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>(c) <b>or</b> (d) correct</li> </ul> |    |    |    |    |    |    |    |    |  |    |    |  |
| (e)     | <p><math>2 \times 3 = 6</math></p> <p style="text-align: center;"><b>OR</b></p> <p><math>\# \{ A1, A2, A3, B1, B2, B3 \} = 6</math></p>   | <p><b>Scale 5B (0, 3, 5)</b></p> <p>Accept correct answer without supporting work</p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>Indication of relevant operation</li> <li>1 correct outcome listed <b>other than A2</b></li> <li>2 or 3 or 5 without supporting work</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>All outcomes listed, but total number not indicated</li> </ul>  |    |    |    |    |    |    |    |    |  |    |    |  |

| Q9  | Model Solution – 20 Marks       | Marking Notes  |
|-----|---------------------------------|--|
| (a) | $2(4) + 3(7) = 29$              | <p><b>Scale 10C (0, 4, 8, 10)</b></p> <p>Accept correct answer without supporting work</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 correct substitution indicated</li> <li>• 8 or 16 or 21 or 26 or 61 or 77 without supporting work</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• <math>2(4) + 3(7)</math></li> </ul>   |
| (b) | $6x - 4 = 26$ $6x = 30$ $x = 5$ | <p><b>Scale 10C (0, 4, 8, 10)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Substitutes an incorrect value for x</li> <li>• Shows understanding of solving equations (e.g. <math>6x = 26 - 4</math>)</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• <math>6x = 30</math></li> <li>• Transposition error, finished correctly</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• 30/6</li> </ul> <p><i>Full Credit</i></p> <ul style="list-style-type: none"> <li>• <math>6(5) - 4 = 26</math></li> </ul> |

| Q10     | Model Solution – 15 Marks   | Marking Notes  |
|---------|---|--|
| (a)&(c) | (a) $R: (1, 2)$<br>$S: (5, 6)$<br>(c) $T$ plotted and labelled correctly            | <p><b>Scale 10D (0, 3, 6, 8, 10)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 ordinate of 1 point correct (i.e. <math>x</math>-value <b>or</b> <math>y</math>-value)</li> <li>• 1 point with co-ordinates reversed (but otherwise correct)</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 point correct</li> <li>• 1 ordinate of <b>each</b> point correct</li> <li>• 2 points with co-ordinates reversed (but otherwise correct)</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 points correct i.e. 2 of <math>R</math>, <math>S</math>, and <math>T</math> (even if <math>T</math> is not labelled)</li> <li>• 3 points with co-ordinates reversed (but otherwise correct)</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• 3 points correct, but <math>T</math> not labelled</li> </ul> |
| (b)     | $= \frac{\sqrt{4^2 + 4^2}}{\sqrt{32}} \text{ or } 4\sqrt{2} \text{ or } 5.656\dots$ | <p><b>Scale 5C (0, 2, 4, 5)</b></p> <p>Accept 5.66 or more accurate without supporting work</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Indicates rise <b>or</b> run, or indicates calculation of either</li> <li>• Correct distance formula</li> <li>• Correct substitution into slope or midpoint formula</li> <li>• Measures the distance with a ruler, tolerance <math>\pm 0.5\text{cm}</math></li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Distance formula correctly filled in</li> <li>• <math>\sqrt{4^2 + 4^2}</math></li> <li>• Incorrect squaring, but finishes correctly</li> </ul>  |

| Q11     | Model Solution – 15 Marks   | Marking Notes  |
|---------|---|--|
| (a)&(b) | (a) $4880 - 4000 = \text{€}880$<br><br>(b) $\frac{880}{4000} \times 100 = 22\%$ | <p><b>Scale 15D (0, 4, 8, 13, 15)</b></p> <p>Accept correct answer without supporting work</p> <p>Accept 22 as answer in (b)</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Subtraction indicated in (a)</li> <li>• Work of merit in (b), e.g. shows understanding of percentages, or indicates relevant division</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (a) correct</li> <li>• 1.22 or 0.22 (or equivalent) in (b)</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• (b) correct</li> <li>• (a) correct <b>and</b> work of merit in (b)</li> </ul> |

| Q12 | Model Solution – 10 Marks   | Marking Notes  |
|-----|---|--|
|     | $J + 5$<br>$J - 4$<br>$2J$<br>$\frac{1}{3}J$ <b>or</b> $\frac{J}{3}$ <b>or</b> $J \div 3$ | <p><b>Scale 10D (0, 3, 6, 8, 10)</b></p> <p>Accept correct answers without supporting work</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit in one part, e.g. shows operation described (+5, -4, etc.)</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 3 parts, as described above</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 parts correct</li> <li>• Work of merit in all 4 parts, as described above</li> </ul> |

| Q13 | Model Solution – 15 Marks | Marking Notes  |
|-----|---------------------------|--|
| (a) | $34 + 41 = 75 \text{ m}$  | <p><b>Scale 5B (0, 3, 5)</b></p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Relevant operation indicated</li> <li>• 150 without supporting work</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• Correct answer, unit incorrect or omitted</li> </ul> |

| Q13 | Model Solution – 15 Marks   | Marking Notes   |
|-----|---|---|
| (b) | $\sqrt{34^2 + 41^2}$ $= \sqrt{2837}$ $= 53.26\dots$ $= 53.3 \text{ m [1 DP]}$ | <p><b>Scale 5C (0, 2, 4, 5)</b></p> <p>Accept correct answer without unit</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• <math>34^2</math> or <math>41^2</math></li> <li>• <math>a^2 = b^2 + c^2</math>, or equivalent</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• <math>\sqrt{34^2 + 41^2}</math></li> <li>• Incorrect squaring, but finishes correctly</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• Rounding incorrect or omitted</li> </ul> |
| (c) | $75 - 53 \cdot 3$ $= 21 \cdot 7$ $= 22 \text{ m [nearest m]}$                 | <p><b>Scale 5B (0, 3, 5)</b></p> <p>Accept correct answer without unit</p> <p>Accept 150 minus answer in (b) for <i>Full Credit</i></p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Indicates subtraction</li> <li>• 75 or 150 without supporting work</li> </ul> <p><i>Full Credit –1</i></p> <ul style="list-style-type: none"> <li>• Rounding incorrect or omitted (if correct in (b))</li> </ul>  |

| Q14 | Model Solution – 10 Marks | Marking Notes  |
|-----|---------------------------|--|
| (a) | $24x + 8y + 12$           | <p><b>Scale 5C (0, 2, 4, 5)</b></p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 term correct</li> <li>• Shows understanding of distribution</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 terms correct</li> </ul> |
| (b) | $3(x - 4)$                | <p><b>Scale 5B (0, 3, 5)</b></p> <p><i>Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Indicates 3 or x or 4</li> <li>• Indicates ( ) ( )</li> <li>• Solves <math>3x - 12 = 0</math> correctly</li> </ul>  |

| Q15     | Model Solution – 10 Marks  | Marking Notes   |
|---------|--|---|
| (a)&(b) | (a)(i) 3<br><br>(a)(ii) 2<br><br>(b) right-hand box: 4<br><br>(b) left-hand box: 8 | <p><b>Scale 10D (0, 3, 6, 8, 10)</b></p> <p>Accept correct answers without supporting work</p> <p><i>Low Partial Credit</i></p> <ul style="list-style-type: none"> <li>• Work of merit in (a) <b>or</b> (b)<br/>E.g. mixes up x and y (i.e. (i) = 6, (ii) = 0, right-hand box = 10, or left-hand box = 3.5), or indicates relevant point of graph (i.e. (4,3), (2,1), (6,4), or (8,5))</li> <li>• 4 or 1 or 6 or 5 indicated on the x or y axis</li> </ul> <p><i>Mid Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 1 value correct (out of the 4)</li> <li>• Work of merit in (a) <b>and</b> (b)</li> </ul> <p><i>High Partial Credit</i></p> <ul style="list-style-type: none"> <li>• 2 values correct (out of the 4)</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 ghnóthaíonn 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           |