

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle 2026

Marking Scheme

Mathematics

Ordinary 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.

General notes on the marking

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.

Scales and Slips
Certain types of mistake – 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 – are referred to as a **slip** and are denoted with a *. In such cases, 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.

The only marks that may be awarded for a question are those on the appropriate scale in the marking scheme, or *Full Credit –1*.

Instructions regarding penalties for omitted or incorrect units are given in the scheme for each question to which they apply. A penalty for rounding is applied once per unit of marking (i.e., if parts (a) and (b) are marked as a single unit, a penalty for rounding is only applied once for (a) and (b) combined).

Steps
Where steps are listed in the Marking Notes, unless otherwise specified, it is to be taken that they can be independently correct / incorrect – that is, in a candidate's solution, step n can be considered correct even if previous step(s) have not been correctly presented, as long as the work done to arrive at step n from the previous step(s) has not been oversimplified. Note also that these steps may not need to be presented in the order specified in the Marking Notes. In general, it is specifically noted where these do not hold.

Errors
An error is a mistake in a candidate's work that is not considered a slip. Where a question is **not** marked using steps, if a candidate has a single error, they are generally awarded one level of credit below that which they would otherwise have been awarded. Similarly, where they have two errors, they are generally awarded two levels of credit below that which they would otherwise have been awarded. (If they present sufficient work for *Low Partial Credit*, they will be awarded this at a minimum, regardless of the number of errors.) For example, on a C-scale:

- *High Partial Credit*: One error, otherwise fully correct (or fully correct with a *)
- *Low Partial Credit*: Two errors, otherwise fully correct (or fully correct with a *)

Where a question **is** marked using steps, this does not apply. Instead, an error in a step means that the step has not been completed correctly; this does not affect the completion of other steps (unless it oversimplifies the work). So, if a candidate has multiple errors on a single step, they could still be awarded up to *High Partial Credit*, depending on the marking scheme.

Slips and Errors
Where a candidate has a single * on their solution, this is ignored in the awarding of credit unless they would otherwise have *Full Credit*. If they would otherwise have *Full Credit*, then *Full Credit –1* is awarded. Where a candidate has multiple *s, this is generally treated as an error. This applies even where the *s are in different steps.

Multiple answers
Where a solution requires substantial work, all separate attempts are marked and the marks for the best one are awarded, regardless of crossing out.

Where a solution requires selection from the question:

- If a candidate has only one answer, which they have then crossed out, the crossing-out is ignored
- If a candidate has both crossed-out answer(s) and answer(s) that are not crossed out, ignore the crossed-out answer(s) and only mark those that are not crossed out
- If a candidate has multiple answers that are **not** crossed out, award the lowest mark associated with these answers (generally, such a set of answers will end up being considered incorrect).

Excess work
Where a solution requires substantial work, incorrect excess work (i.e. work presented after the answer) is generally not penalised. This does not apply where candidates are asked to write a sentence, or number of sentences, to explain / justify / describe something. In such cases, the answer as a whole is considered.

Where a subsequent part of a question requires candidates to use their answer from a previous part, and an incorrect answer arising from incorrect excess work is used, this is generally treated as an error in the subsequent part, unless it oversimplifies the work involved (in which case a lower level of credit is generally awarded for the subsequent part).

Square brackets
Where something is contained in square brackets in the model solution, it is **not** required for *Full Credit*.

Work of merit
Where the scheme indicates "work of merit" (or "substantial work of merit"), examples are given to exemplify the standard of work required to be considered work of merit (or substantial work of merit) in that particular question.

Accept
Where it is indicated to "accept work, this means that, for this year, such work is to be accepted for *Full Credit*, unless otherwise indicated.

Palette of annotations available to examiners

Symbol	Name	Meaning in the body of the work	Meaning when used in the right margin
✓	Tick	Work of relevance	The work presented in the body of the script merits full credit
✗	Cross	Incorrect work (distinct from an error)	The work presented in the body of the script merits 0 credit
*	Star	Rounding / Unit / Arithmetic error Misreading	
	Horizontal wavy	Error	
P	P		The work presented in the body of the script merits a partial credit for B scales
L	L		The work presented in the body of the script merits low partial credit
M	M		The work presented in the body of the script merits mid partial credit
H	H		The work presented in the body of the script merits high partial credit
F*	F star		The work presented in the body of the script merits Full Credit (– 1)
[	Left Bracket		Another version of this solution is presented elsewhere and it merits equal or higher credit
	Vertical wavy	No work on this page (portion of the page)	
WOM		The candidate has presented work or merit	
o	Oversimplify	The candidate has oversimplified the work	

Note: Where work of substance is presented in the body of the script, the annotation on the right margin should reflect a combination of annotations in the work.

In a **C scale** that is **not** marked using steps, where * and  and  appear in the body of the work, then L should be placed in the right margin.

In the case of a **D scale** with the same annotations, M should be placed in the right margin.

Note: Where work is presented for a question in the answerspace provided, and a separate attempt is presented on additional pages, both attempts are marked.

For each attempt, the annotation for the appropriate credit level is put in the right margin next to that attempt. The annotation for the lower credit level is then left-bracketed, and the mark for the higher credit level is awarded.

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	0, 2, 3, 4, 5
10-mark scale	0, 5, 10	0, 3, 7, 10	0, 4, 6, 8, 10
15-mark scale			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.

Marking scales – level descriptors

A-scales (two categories)

- incorrect response (no credit)
- correct response (full credit)

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)

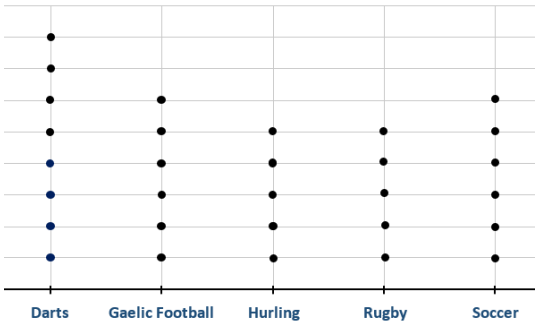
- response of no substantial merit (no credit)
- response with some merit (low partial credit)
- response about half-right (mid partial credit)
- almost correct response (high partial credit)
- correct response (full credit)

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 – 20 marks	Marking Notes
(a)	**(i)** 2026 **(ii)** $46{\cdot}4$ or $\frac{232}{5}$ or $46\frac{4}{10}$ **(iii)** $48 \div (2) = 24$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit:* • Work of merit in one part *High Partial Credit:* • 2 parts correct *Full Credit –1:* • Answer in part **(ii)** rounded
(b), (c)	**(b)** $\frac{8+14}{2} = 11$ **OR** $14 - 8 = 6$ $6 \div 2 = 3$ $8 + 3 = 11$ **(c)** $5, 10, 15, 20, 25, 30, 35, \ldots$ $6, 12, 18, 24, 30, 36, \ldots$ LCM: 30 **OR** Prime factors of 5: 5 Prime factors of 6: 3×2 LCM $= 5 \times 3 \times 2 = 30$	**Scale 5D (0, 2, 3, 4, 5)** *Low Partial Credit:* • Work of merit, for example, in **(b)**, e.g. indicates division by 2; finds difference of 6; in **(c)**, lists a relevant multiple or prime factor *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part

Q2	Model Solution – 20 marks	Marking Notes
(a)	**(i)** $1 \times 9{\cdot}50 \;=\; 9{\cdot}50$ $1 \times 15{\cdot}95 \;=\; 15{\cdot}95$ $2 \times 23{\cdot}95 \;=\; 47{\cdot}90$ Total Cost $\;=\; 73{\cdot}35$ **(ii)** $50 + 2(20) = \; 90$ Change $\;=\; 90 - 83{\cdot}35$ $\;=\; [€]\, 6{\cdot}65$	**Scale 10D (0, 4, 6, 8, 10)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, finds a relevant cost; in **(ii)**, $50 + 20$ or 2×20; some relevant addition or subtraction *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part
(b)	**(i)** Burger and Cheesecake Chicken and Ice Cream (or any two other correct combinations) **(ii)** $3 \times 4 \;=\; 12$ **OR** *Lists the different choices / draws tree diagram, and states* 12	**Scale 10D (0, 4, 6, 8, 10)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, one combination given; in **(ii)**, at least one other combination listed; some understanding of principle of counting; recognises 3 or 4 *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part *Full Credit (-1):* • Lists all 12 combinations but doesn't state 12 as answer

Q3	Model Solution – 20 marks	Marking Notes
(a)	**(i)** <table><tr><td>Darts</td><td>Gaelic Football</td><td>Hurling</td><td>Rugby</td><td>Soccer</td></tr><tr><td>**8**</td><td>6</td><td>5</td><td>**5**</td><td>**6**</td></tr></table> **(ii)** 	**Scale 10D (0, 4, 6, 8, 10)** Accept line plot consistent with candidate's table *Low Partial Credit:* • Work of merit, for example, correct entry in table or line plot *Mid Partial Credit:* • Part **(i)** correct • Work of merit in both parts *High Partial Credit:* • Part **(ii)** correct • Part **(i)** correct and work of merit in part **(ii)** *Full Credit (-1):* • One incorrect entry in table or incorrect/missing dot in line plot
(b)	**(i)** *Answer*: Mode *Value of measure of centre*: Darts **(ii)** *Answer*: Yes *Reason*: More people may have been watching Darts on TV during the Darts Championship	**Scale 5D (0, 2, 3, 4, 5)** Accept answers correct with previous work in part **(i)** Accept an answer of "no" in part **(ii)** with a valid reason as fully correct *Low Partial Credit:* • Work of merit, for example, in **(i)**, correct answer **or** value of measure of centre; gives 8 as value of measure of centre; in **(ii)**, correct answer with no or incorrect reason; work of merit in reason *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part

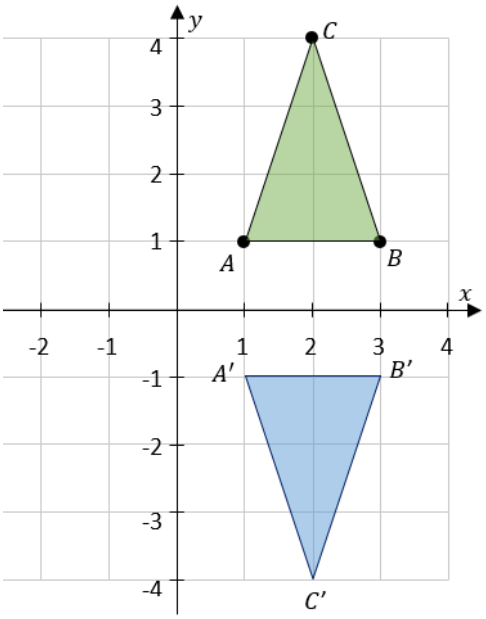
Q3	Model Solution – 20 marks	Marking Notes
(c)	**(i)** <table><tr><td>**Team**</td><td>Alder F.C.</td><td>Ballynore Town</td><td>Castlemore Celtic</td><td>Derryduff United</td></tr><tr><td>**Angle**</td><td>$90°$</td><td>$\mathbf{60°}$</td><td>$\mathbf{120°}$</td><td>$\mathbf{90°}$</td></tr></table> **(ii)** $\frac{90}{360} \times 60 = 15$ [students]	**Scale 5D (0, 2, 3, 4, 5)** Allow a tolerance of $\pm 3°$ *Low Partial Credit:* • Work of merit, for example, in **(i)**, one correct angle; calculates angle for CC based on incorrect angle for BT (or vice versa); in **(ii)**, mentions $360°$ or $\frac{90}{360}$ *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part

Q4	Model Solution – 20 marks	Marking Notes
(a) (i) (ii)	**(i)** 32 **km** **(ii)** 10 [minutes]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, recognises a relevant distance; in **(ii)**, states 90 or 100 *High Partial Credit:* • One part correct *Full Credit -1:* • Apply a * for incorrect or no units in part **(i)**
(a) (iii)	130 minutes $= 2$ hours 10 mins $9{:}00 + 2{:}10 = 11{:}10$ [a.m.]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, gives 130 *High Partial Credit:* • Finds 2 hours 10 mins
(a) (iv)	Fastest Part: Cycle Reason: The graph is steeper **OR** It takes less time to do 4 km **OR** The slope is bigger *(or any other valid reason)*	**Scale 5B (0, 3, 5)** *Partial Credit:* • Work of merit, for example, correct answer with incorrect or no reason; incorrect answer with work of merit in the reason
(b)	**(i)** $\frac{30}{60}$ or $\frac{1}{2}$ **(ii)** Speed $= \frac{distance}{time} = \frac{4}{1/2} = 8$ [km/hour]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, mentions 60; in **(ii)**, relevant formula; some correct substitution into relevant formula *High Partial Credit:* • One part correct • Work of merit in both parts

Q5	Model Solution – 25 marks	Marking Notes
(a) **(b)**	**(a)** Area $= 5^2 = 25$ [cm^2] **(b)** Length $= 64 \div 4 = 16$ [cm]	**Scale 10D (0, 4, 6, 8, 10)** *Low Partial Credit:* • Work of merit, for example, in **(a)**, correct formula; in **(b)**, correct formula, indicates division by 4 *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part
(c)	$(2x+3)(x+5)$ $= 2x(x+5)+3(x+5)$ $= 2x^2+10x+3x+15$ $= 2x^2+13x+15$ **OR** $2x$ $+3$ x | $2x^2$ | $3x$ $+5$ | $10x$ | 15 Answer: $2x^2+13x+15$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit:* • Work of merit, for example, sets up multiplication (including an arrow) or any correct multiplication *High Partial Credit:* • 3 correct terms in multiplication • $2x^2+10x+3x+15$ • Correct answer without supporting work
(d)	**(i)** $\lvert\angle X\rvert + 120 = 180°$ $\lvert\angle X\rvert = 60°$ $\lvert\angle Y\rvert + 55° + 60° = 180°$ $\lvert\angle Y\rvert + 115° = 180°$ $\lvert\angle Y\rvert = 65°$ **OR** $\lvert\angle Y\rvert = 120° - 55^o = 65^o$ **(ii)** Answer: Scalene Reason: All angles are different	**Scale 10D (0, 4, 6, 8, 10)** Consider the solution as consisting of 3 steps: **Step 1.** Calculating $\lvert\angle X\rvert$ **Step 2.** Calculating $\lvert\angle Y\rvert$ **Step 3.** Answering part **(ii)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, effort at using a relevant theorem; in **(ii)**, some understanding of scalene, isosceles, or equilateral triangles; correct answer ticked *Mid Partial Credit:* • 1 step correct *High Partial Credit:* • 2 steps correct

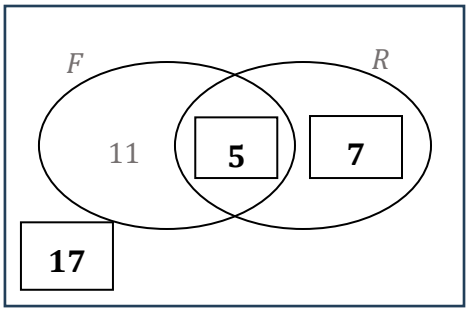
Q6	Model Solution – 30 marks	Marking Notes
(a) **(b)**	**(a)**  **(b)** | 1 | 2 | 3 | 4 | 5 | | **3** | 5 | **7** | **9** | **11** |	**Scale 10D (0, 4, 6, 8, 10)** *Low Partial Credit:* • Work of merit, for example, in **(a)**, pattern 3 with 1 extra stick; in **(b)**, one correct entry in table *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part
(c) **(d)**	**(c)** $301 + 2 = 303$ [sticks] **(d)** Answer: Linear Reason: It goes up by 2 each time *or any other valid reason*	**Scale 10D (0, 4, 6, 8, 10)** Note that the pattern produced in **(b)** may be non-linear, leading to "non-linear" being correct *Low Partial Credit:* • Work of merit, for example, in **(c)**, indicates addition of 2; in **(d)**, answer correct *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part
(e)	**(i)** Pattern $38 = 2(38) + 1$ $= 76 + 1$ $= 77$ **(ii)** $2k + 1 = 27$ $2k = 26$ $k = 13$ **OR** Solution found by listing terms	**Scale 10D (0, 4, 6, 8, 10)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, some correct substitution; in **(ii)**, sets up equation, substitutes k, some correct transposition; trial and error *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part

Q7	Model Solution – 25 marks	Marking Notes
(a)	**(i)** $20 + 47 + 61 + 30 + 12 + 10$ $= 180$ **(ii)** $30 + 12 + 10$ $= 52$	**Scale 5D (0, 2, 3, 4, 5)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, adds two relevant numbers; in **(ii)**, identifies 30, 12, or 10 *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part
(b)	**(i)** Mean $= \frac{9{\cdot}9 + 8{\cdot}6 + 7{\cdot}2 + 9{\cdot}8 + 9{\cdot}0}{5}$ $= \frac{44{\cdot}5}{5}$ $= 8{\cdot}9$ [kg] **(ii)** $7{\cdot}2, 8{\cdot}6, 9{\cdot}0, 9{\cdot}8, 9{\cdot}9$ Median $= 9{\cdot}0$ [kg]	**Scale 10D (0, 4, 6, 8, 10)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, relevant addition, indicated division by 5; calculates median; in **(ii)**, puts numbers in order or shows understanding of median as middle number; calculates mean *Mid Partial Credit:* • One part correct • Work of merit in both parts • Calculates correctly median in **(i)** or mean in **(ii)** and work of merit for other average *High Partial Credit:* • One part correct **and** work of merit in other part • Calculates correctly median in **(i)** and mean in **(ii)**
(c)	$756{\cdot}40 - 21{\cdot}40 = 735$ $735 \div 5 = [€]\ 147$	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, indicated division by 5; subtracts insurance *High Partial Credit:* • $(756{\cdot}40 \div 5) - 21{\cdot}40 = 129{\cdot}88$
(d)	$400 \times 0{\cdot}89 = [£]\ 356$	**Scale 5B (0, 3, 5)** *Partial Credit:* • Work of merit, for example, incorrect division by the exchange rate

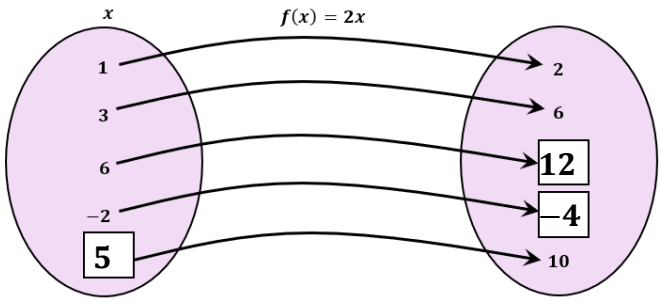
Q8	Model Solution – 25 marks	Marking Notes
(a)	$B = (3,1)$ $C = (2,4)$	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, one coordinate correct *High Partial Credit:* • One correct Point • Coordinates of B and C reversed
(b) **(c)**	**(b)** Answer: 1 **(c)**  	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, in **(b)**, axis of symmetry constructed; in **(c)**, one correct point plotted or found; correct S_y image; correct S_o image; attempt at axial symmetry through the x-axis *High Partial Credit:* • Part **(b)** correct and work of merit in part **(c)** • Part **(c)** correct *Full Credit (−1):* • Points not labelled or labelled incorrectly (accept A as A', and so on).
(d)	Area $= \frac{1}{2} \times b \times h$ $= \frac{1}{2} \times 2 \times 3$ $= 3$ [units^2]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, base or perpendicular height found; correct formula *High Partial Credit:* • Correct base and height identified with some correct substitution into formula

Q8	Model Solution – 25 marks	Marking Notes
(e)	$y = 3x - 2$ as the line AC will cross the y -axis at the point $(0, -2)$ **OR** $A(1, 1)$ $y - 1 = 3(x - 1)$ $y - 1 = 3x - 3$ $y = 3x - 2$ **OR** $C(2, 4)$: $y - 4 = 3(x - 2)$ $y - 4 = 3x - 6$ $y = 3x - 2$	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, continues line AC on graph through the y-axis, some correct substitution into equation of line; $y - y_1 = m(x - x_1)$; shows understanding of m being the slope or c being the y-intercept *High Partial Credit:* • Substitutes the correct slope into the equation, i.e. $y = 3x + c$ • Substitutes the correct y-intercept into the equation, i.e. $y = mx - 2$ • Fully correct substitution onto equation of a line and brackets multiplied, i.e. "$y - 1 = 3x - 3$" or "$y - 4 = 3x - 6$"

Q9	Model Solution – 15 marks	Marking Notes
(a) **(b)** **(c)**	**(a)** $550 \times 0{\cdot}2 = [€]\ 110$ **(b)** $110 - 78 = [€]\ 32$ **(c)** $550 - 32 = [€]\ 518$ **OR** $550 - 110 + 78 = [€]\ 518$	**Scale 15D (0, 4, 8, 12, 15)** *Low Partial Credit:* • Work of merit, for example, in **(a)**, mentions $0{\cdot}2$; shows knowledge of percentages; in **(b)**, indicates subtraction of gross tax; use of gross tax; in **(c)**, subtracts gross tax from gross income; adds tax credits to gross; *Mid Partial Credit:* • One part correct *High Partial Credit:* • Two parts correct

Q10	Model Solution – 20 marks	Marking Notes
(a) **(b)**	**(a)**  **(b)** 7 [students]	**Scale 10D (0, 4, 6, 8, 10)** Consider the solution as consisting of 4 steps: **Step 1.** Finds $\#(F \cap R)$ **Step 2.** Finds $\#(R/F)$ **Step 3.** Finds $\#(F \cup R)'$ **Step 4.** Finds answer to part **(b)** *Low Partial Credit:* • Work of merit in one step *Mid Partial Credit:* • Two steps correct *High Partial Credit:* • Three steps correct
(c) **(d)**	**(c)** 11 students like football but not reading **(d)** $\frac{17}{40}$ or $0 \cdot 425$	**Scale 10D (0, 4, 6, 8, 10)** *Low Partial Credit:* • Work of merit, for example, in **(c)**, one relevant part of statement (states "11 like football" or "11 don't like football"), or gives explanation for $F \backslash R$; in **(d)**, correct numerator or denominator *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct and work of merit in the other part

Q11	Model Solution – 20 marks	Marking Notes
(a)	**(i)** $r = 2$ cm **(ii)** Volume $= \pi \times (2)^2 \times (7)$ $= 87 \cdot 96 \ldots$ $= 88$ [cm^3]	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, indicates division by 2; in **(ii)**, some correct substitution in part **(ii)** *High Partial Credit:* • Part **(i)** correct and fully correct substitution into formula • Part **(ii)** correct with incorrect part **(i)** *Full Credit – 1:* • Part **(ii)** correct but $r = 2$ not stated in part **(i)** • Apply a * for incorrect or no rounding in **(ii)**
(b)	**(i)** Length $= 6 \times 4 = 24$ [cm] **(ii)** Volume $= l \times w \times h$ $= 24 \times 12 \times 7$ $= 2016$ **cm^3**	**Scale 10D (0, 4, 6, 8, 10)** *Low Partial Credit:* • Work of merit, for example, in **(i)**, some relevant multiplication; identifies 6 or 4; in **(ii)**, some relevant multiplication or correct formula *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct and work of merit in the other part *Full Credit – 1:* • Part **(ii)** correct but $l = 24$ not written into box in **(i)** • Incorrect or no units in **(ii)**

Q12	Model Solution – 15 marks	Marking Notes
(a) **(b)**	**(a)** $6a + a + 2a - 3b + b$ $9a - 2b$ **(b)** $(x - 3)\,(x - 4)$	**Scale 10D (0, 4, 6, 8, 10)** *Low Partial Credit:* • Work of merit, for example, in **(a)**, effort at grouping like terms; in **(b)**, finds factors of x^2 or ± 12 *Mid Partial Credit:* • One part correct • Work of merit in both parts *High Partial Credit:* • One part correct **and** work of merit in other part
(c)		**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, relevant value subbed into $f(x)$ • One correct value *High Partial Credit:* • Two correct values

Q13	Model Solution – 15 marks	Marking Notes
(a)	$x^2 = 6^2 + 8^2$ $x^2 = 36 + 64$ $x^2 = 100$ $x = 10$ [cm]	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit:* • Work of merit, for example, indicates squaring of any relevant term; states Pythagoras theorem; • Finds 100 without supporting work *High Partial Credit:* • Finds 100 with supporting work • Correct answer without supporting work *Full Credit -1:* • Leaves answer as $\sqrt{100}$
(b)	**(i)** $\tan A = \frac{6}{8}$ **(ii)** $A = \tan^{-1}\left(\frac{6}{8}\right)$ $= 36{\cdot}8698\ldots$ $= 37°$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit:* • Work of merit, for example, opposite/a or adjacent/b correctly labelled *High Partial Credit:* • One part correct *Full Credit -1:* • Apply a * for incorrect or no rounding in **(ii)** • Apply a * for calculator in incorrect mode