Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2022

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.

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.

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

A-scales (two categories)

- incorrect response
- correct response

B-scales (three categories)

- response of no substantial merit
- partially correct response
- correct response

C-scales (four categories)

- response of no substantial merit
- response with some merit
- almost correct response
- correct response

D-scales (five categories)

- response of no substantial merit
- response with some merit
- response about half-right
- almost correct response
- correct response

E-scales (six categories)

- response of no substantial merit
- response with some merit
- response almost half-right
- response more than half-right
- almost correct response
- correct response

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 also be awarded. Such cases are denoted with a * and 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 scale above, or *Full Credit -1*.

A rounding penalty is applied only once in each section (a), (b), (c) etc. A penalty for an omitted unit is applied only once in each section (a), (b), (c) etc. There is no penalty for omitted units if the question specifies the unit to be used in the answer, and there is generally no penalty for an omitted euro symbol in questions involving money. Where units are given in square brackets in the solution, the correct answer without units is accepted for *Full Credit*.

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

Section A				Section B	
Question 1		**Question 5**		**Question 9**	
(a)(i)	5B	(a)(i)	10C	(a)(i)(ii)	10D
(a)(ii)	5C	(a)(ii)	5C	(a)(iii)	5B
(a)(iii)	5C	(b)(i)	10C	(a)(iv)	5D
(b)(i)	5B	(b)(ii)	5B	(b)(i)	10C
(b)(ii)	10C			(b)(ii)	5B
Question 2		**Question 6**		(b)(iii)	5D
(a)	5C	(a)(i)	15C	(b)(iv)	10C
(b)(i)	10C	(a)(ii)(iii)	10D	**Question 10**	
(b)(ii)	5B	(b)	5C	(a)(i)	5C
(b)(iii)	10C			(a)(ii)	5C
		Question 7		(a)(iii)	5C
Question 3		(a)(i)	5B	(a)(iv)	10D
(a)	10C	(a)(ii)	5C	(b)(i)	5C
(b)	5B	(a)(iii)	10C	(b)(ii)	10C
(c)	5B	(b)(i)	5B	(b)(iii)	10C
(d)	10C	(b)(ii)	5C	**Question 11**	
				(a)(i)(ii)	10C
Question 4		**Question 8**		(a)(iii)	5B
(a)	10C	(a)(i)	10C	(b)(i)	5C
(b)	10C	(a)(ii)	5C	(b)(ii)	5C
(c)	10C	(b)	15C	(b)(iii)	5B
				(c)	10C
				(d)	5C
				(e)	5C

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 *Partial Credit*
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)	
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** 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.

A ✓ in the body of the work may sometimes be used to indicate where a portion of the work presented has value and has merited one of the levels of credit described in the marking scheme. The level of credit is then indicated in the right margin.

Detailed marking notes

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.

Where steps are listed in the Marking Notes, unless otherwise specified, they are taken as being independent – 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.

Accept correct answer without supporting work for *Full Credit* in all cases, other than where the question specifies to show working out, as in Q.4(a)(c) and Q.9(b)(iii). In these cases, *Low Partial Credi*t applies.

Where "finishes correctly" is included in the Marking Notes, this is taken to mean: "finishes using the correct method, and the (incorrect) values the candidate has already found". "Otherwise correct" is to be understood in a similar manner.

Many questions involve multiplying / dividing 3 numbers, and are marked on C scales. In general, this is marked as:

- *Low Partial Credit*: 2 numbers with correct operator
- *High Partial Credit*: all 3 numbers with correct operator, but not evaluated or evaluated incorrectly

Q1	Model Solution – 30 Marks	Marking Notes
(a) (i)	Mode = 10 [minutes]	**Scale 5B (0, 2, 5)** *Partial Credit* • Shows understanding of mode as "most common", for example, mode as 0
(a) (ii)	Range = $30 - 6 = 24$ [minutes]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, relevant numbers listed • 6 or 30 written *High Partial Credit* • 6 and 30 written
(a) (iii)	6^{th} term = 15 [minutes]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Shows understanding of median, for example, "middle number" or leaf number 5 written • 176 or $\frac{176}{11}$ or16 • Relevant list of numbers but incomplete *High Partial Credit* • Full ordered list written
(b) (i)	34 entered into stem and leaf correctly	**Scale 5B (0, 2, 5)** *Partial Credit* • Work of merit, for example, indicates correct place on stem and leaf plot
(b) (ii)	$16 \times 11 = 176$ $176 + 34 = 210$ $\frac{210}{12} = 17{\cdot}5$ [minutes] **OR** $\frac{6+10+10+\cdots+25+30+34}{12}$ $= \frac{210}{12} = 17{\cdot}5$ [minutes]	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Full ordered list • 11 or 12 or 176 written *High Partial Credit* • 210 calculated

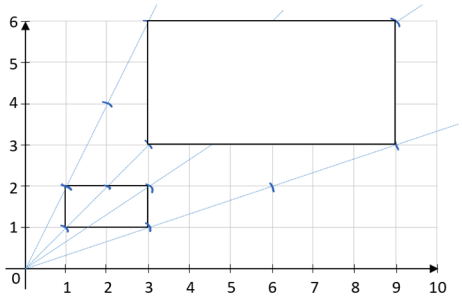
Q2	Model Solution – 30 Marks	Marking Notes
(a)	$\frac{40}{100} \times \frac{15}{100} = \frac{3}{50}$ or $0{\cdot}06$ $\frac{3}{50} \times 600 = 36$ **OR** $0.4 \times 600 = 240$ $0.15 \times 240 = 36$	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, $\frac{40}{100}$ or 0.4 • $\frac{15}{100}$ or 0.15 *High Partial Credit* • 240 calculated correctly • $\frac{3}{50}$ calculated correctly
(b) (i)	$200 + 160 = 360$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • 160 or 200 *High Partial Credit* • 200 and 160 written
(b) (ii)	$\frac{2}{5} \times 360 = 144$	**Scale 5B (0, 2, 5)** *Partial Credit* • Work of merit, for example, 0.4 or $\frac{2}{5}$
(b) (iii)	$\frac{3}{10} \times 200 = 60$ $144 - 60 = 84$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Work of merit, for example, a relevant operation *High Partial Credit* • Calculates 60 • Error in finding 60 but finishes correctly

Q3	Model Solution – 30 Marks	Marking Notes
(a)	$12{\cdot}5 \times 8 \times 19{\cdot}6$ $= 1960$ [cm^3]	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Correct relevant formula • Indicates multiplication of two dimensions *High Partial Credit* • Correct substitution into formula but no or incorrect answer
(b)	$1960 \div 2{\cdot}5 = 784$	**Scale 5B (0, 2, 5)** *Partial Credit* • 1960 or candidates answer from (i)
(c)	$16 \times 14 \times 2{\cdot}5 = 560$ [cm^3]	**Scale 5B (0, 2, 5)** *Partial Credit* • Indicates multiplication of two relevant numbers
(d)	$35 \times 1{\cdot}17 =$ [€]$40{\cdot}95$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • $35 \div 1.17$ *High Partial Credit* • $35 \times 1{\cdot}17$

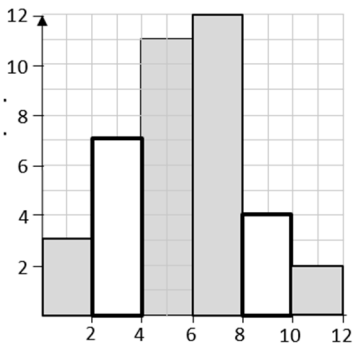
Q4	Model Solution – 30 Marks	Marking Notes
(a)	Answer: B Justification: A: $\frac{2{\cdot}99}{80} = 0{\cdot}037375$ B: $\frac{6{\cdot}99}{220} = 0{\cdot}031\dot{7}\dot{2}$ **OR** A: $\frac{2{\cdot}99}{80} \times 220 = 8{\cdot}22\ldots$ **OR** B: $\frac{6{\cdot}99}{220} \times 80 = 2{\cdot}54\ldots$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Correct answer with no justification • Some relevant work in justification *High Partial Credit* • Correctly calculates price per teabag of Packet A and packet B but no/incorrect answer given • Correct answer given with some relevant work in justification Accept as here, without explicit reason (e.g. "$0 \cdot 037 > 0 \cdot 031$")
(b)	$\frac{5}{40} \times 100 = 12.5\%$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Any relevant percentage work, for example, mention of 100 • 35 written *High Partial Credit* • $\frac{5}{40}$ • $\frac{35}{40} \times 100 = 87.5\%$ • $\frac{5}{35} \times 100 = 14.28\%$
(c)	Multiples of 5 less than 30: $5, 10, 15, 20, 25$ Multiples of 3 less than 30: $3,6,9, \mathbf{12}, 15,18,21, \mathbf{24}, 27$ Multiples of 4 less than 30: $4,8, \mathbf{12}, 16,20, \mathbf{24}, 28$ Answer= 25 students **OR** Groups of 3, one left over: $4, 7, 10, \mathbf{13}, 16, 19, 22, \mathbf{25}, 28$ Groups of 4, one left over: $5, 9, \mathbf{13}, 17, 21, \mathbf{25}, 29$ Answer $= 25$ [students]	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Work of merit, for example, writes out a multiple of 3 or 4 or 5 *High Partial Credit* • Finds a common multiple of 3 and 4 less than 30 • A list of two relevant multiples • 4, 7, 10, 13, ... and 5, 9, 13, 17, ...

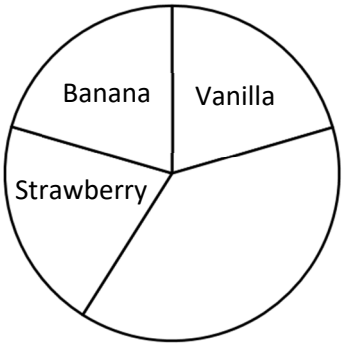
Q5	Model Solution – 30 Marks	Marking Notes
(a) (i)	$€15000 \times 0{\cdot}08 = €1200$ $€15000 + €1200 = €16200$ **OR** $€15000 \times 1.08 = €16200$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Any relevant percentage work, for example mention of 100 • Mentions 0·08 or 1·08 or 108% *High Partial Credit* • Calculates €1200
(a) (ii)	$€16200 - €10000 = €6200$ $€6200 \times 1{\cdot}08 = €6696$ **OR** $€6200 \times 0{\cdot}08 = €496$ $€6200 + €496 = €6696$	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Any relevant percentage work, for example mention of 100 • Mentions 0·08 or 1·08 or 108% • Finds 6200 *High Partial Credit* • Finds 6200 **and** indicates multiplication by 0·08 or 1·08 • Calculates €496
(b) (i)	Length of A$= \sqrt{36} =$ 6 cm Length of B $= \sqrt{9} =$ 3 cm	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Work of merit, for example, $\sqrt{36}$ or $\sqrt{9}$ • 9 or 2.5 or both *High Partial Credit* • Calculates one side correctly
(b) (ii)	$9 \times 4 = 36$ [cm]	**Scale 5B (0, 2, 5)** *Partial Credit* • Work of merit, for example, $9 + 9$ or perimeter formula • 9 or 4 written • 24 or 12 written

Q6	Model Solution – 30 Marks	Marking Notes
(a) (i)	$(1,1)$ $(2,1)$ $(3,1)$ $(1,2)$ $(2,2)$ $(3,2)$ $(1,3)$ $(2,3)$ $(3,3)$ $(1,4)$ $(2,4)$ $(3,4)$	**Scale 15C (0, 5, 10, 15)** *Low Partial Credit* • 1 correct entry (accept if it has the order reversed) *High Partial Credit* • 5 correct entries (accept if they have the order reversed) *Full Credit –1* • 8 correct entries (accept if they have the order reversed) • 9 entries, some or all with order reversed
(a) (ii) (a) (iii)	$\frac{3}{12}$ or $\frac{1}{4}$ $\frac{6}{12}$ or $\frac{1}{2}$	**Scale 10D (0, 3, 5, 8, 10)** *Low Partial Credit* • Work of merit in either part, for example, correct numerator or correct denominator as part of a fraction *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
(b)	$\frac{37}{44}$	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, 37 or 44 • 45 or 7 *High Partial Credit* • Correct numerator or correct denominator as part of a fraction • Finds 37 and 44

Q7	Model Solution – 30 Marks	Marking Notes
(a) (i)	Area = $2 \times 1 = 2$ [cm^2]	**Scale 5B (0, 2, 5)** *Partial Credit* • Work of merit, for example, correct area formula
(a) (ii)	 Tolerance lines $\pm 0.2\ cm$	**Scale 5C (0, 2, 3, 5)** Accept correct enlargement without any construction lines. *Low Partial Credit* • Any one correct construction line drawn • Part of a side correctly drawn (including if a side is overextended) *High Partial Credit* • One fully correct side drawn
(a) (iii)	Ratio is $1:3^2 = 1:9$ **OR** Area image $= 3 \times 6 = 18$ Ratio is $2:18 = 1:9$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Mentions 3^2 • Calculates 18 *High Partial Credit* • Calculates 9 correctly • Writes 2:18 • Calculates area of one rectangle
(b) (i)	$\frac{600}{200}$ (or equivalent)	**Scale 5B (0, 2, 5)** *Partial Credit* • $\frac{200}{600}$ • Mentions $\frac{O}{A}$
(b) (ii)	$\tan^{-1}\frac{600}{200} = 71{\cdot}56\ldots$ $A = 72[°]$ [nearest degree]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • $\tan A = 3$ or equivalent • Finds $\tan 3$ (0.0524) *High Partial Credit* • $\tan^{-1} 3$ (or equivalent) written but not evaluated

<table>
<tr><th>Q8</th><th>Model Solution – 30 Marks</th><th>Marking Notes</th></tr>
<tr><td>(a)
(i)</td><td>$54 \times 5 \times 2 = 540$ km</td><td>Scale 10C (0, 3, 7, 10)
Low Partial Credit
• Indicates multiplication of two relevant numbers
High Partial Credit
• Indicates product of three relevant numbers, but not correctly evaluated
Full Credit –1
• Correct value, but no or incorrect unit</td></tr>
<tr><td>(a)
(ii)</td><td>$\frac{540 \times 1{\cdot}70}{12{\cdot}5} = €73{\cdot}44$</td><td>Scale 5C (0, 2, 3, 5)
Low Partial Credit
• A pair of numbers with correct operation, that is, $540 \times 1{\cdot}70$ or $\frac{1{\cdot}70}{12{\cdot}5}$ or $\frac{540}{12{\cdot}5}$
High Partial Credit
• $\frac{540 \times 1{\cdot}70}{12{\cdot}5}$ indicated, but not correctly evaluated</td></tr>
<tr><td>(b)</td><td><table><tr><td>5</td><td>2</td><td>10</td></tr><tr><td>6</td><td>3</td><td>18</td></tr><tr><td>9</td><td>3</td><td>27</td></tr><tr><td>11 (or 2)</td><td>2 (or 11)</td><td>22</td></tr></table></td><td>Scale 15C (0, 5, 10, 15)
Low Partial Credit
• One correct entry
High Partial Credit
• Three correct entries
Full Credit –1
• Answer in last row given as $(22, 1)$ or $(1, 22)$</td></tr>
</table>

Q9	Model Solution – 50 Marks	Marking Notes
(a) (i) (a) (ii)	 | 3 | 7 | **11** | **12** | 4 | **2** |	**Scale 10D (0, 3, 5, 8, 10)** *Low Partial Credit* • Work of merit in (i) or (ii), for example, one value / bar correct *Mid Partial Credit* • Work of merit in (i) and (ii) • Part (i) or (ii) correct *High Partial Credit* • One part correct and work of merit in the other part
(a) (iii)	$3 + 7 + 11 = 21$	**Scale 5B (0, 2, 5)** *Partial Credit* • Work of merit, for example 3 or 7 or 11
(a) (iv)	$(3 + 7 + 11 + 12 + 4 + 2) + 11$ $= 39 + 11 = 50$ $\frac{39}{50} \times 100 = 78\%$	**Scale 5D (0, 2, 3, 4, 5)** *Low Partial Credit* • Work of merit, for example, finds 39 *Mid Partial Credit* • Calculates 50 *High Partial Credit* • Calculates 22%
(b) (i)	$D = S \times T$ $D = 75 \times \frac{20}{60}$ $D = 25$ km **OR** $\frac{75}{3} = 25$ km	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Work of merit, for example, correct formula or $\frac{20}{60}$ *High Partial Credit* • Indicates $\frac{75}{3}$ or similar, but doesn't evaluate correctly *Full Credit –1* • Correct value but no or incorrect unit
(b) (ii)	$3 \times 4 = 12$	**Scale 5B (0, 2, 5))** *Partial Credit* • Work of merit, for example, lists one possible option other than (Plain, Vanilla)

Q9	Model Solution – 50 Marks	Marking Notes
(b) (iii)	 Tolerance $\pm 5^0$ $360 - 120 = 240$ $240 \div 3 = 80°$	**Scale 5D (0, 2, 3, 4, 5)** *Low Partial Credit* • Work of merit, for example, 360 written *Mid Partial Credit* • 240 calculated *High Partial Credit* • 80^0 calculated but pie chart incorrectly completed or not at all
(b) (iv)	$\frac{120}{360} \times 150 = 50$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • A pair of numbers with correct operation, that is, 120×150 or $\frac{120}{360}$ or $\frac{150}{360}$ *High Partial Credit* • $\frac{120}{360} \times 150$ indicated, but not correctly evaluated

Q10	Model Solution – 50 Marks	Marking Notes
(a) (i)	$288 \div 24 = 12$ cm	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, correct area formula *High Partial Credit* • $288 \div 24$
(a) (ii)	$l = 2\pi r$ $l = 2 \times \pi \times 7$ $l = 43{\cdot}9 \ldots = 44$ [cm] [nearest cm]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, correct formula *High Partial Credit* • Fully substituted formula
(a) (iii)	$24 + 12 + 12 + 10 + 22$ $= 80$ [cm]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, adds two relevant figures, or finds a relevant length not already found *High Partial Credit* • Finds all relevant side-lengths • Mishandles or omits length of one side, otherwise correct
(a) (iv)	$(24 \times 12) + \frac{1}{2}(\pi r^2)$ $288 + \frac{1}{2}(\pi \times 7^2)$ $288 + \frac{1}{2}(154)$ $288 + 77 = 365$ [cm²]	**Scale 10D (0, 3, 5, 8, 10)** *Low Partial Credit* • Work of merit, for example, correct relevant formula *Mid Partial Credit* • Finds area of rectangle or area of circle *High Partial Credit* • One correct area and work of merit to find the second relevant area

Q10	Model Solution – 50 Marks	Marking Notes
(b) (i)	Tolerance lines $\pm 0.2\ cm$	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • One arc/line correctly drawn *High Partial Credit* • Two arcs correctly drawn but triangle not completed
(b) (ii)	$7.5^2 = 4.5^2 + 6^2$ $56.25 = 20.25 + 36$ $56.25 = 56.25$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Correct relevant formula *High Partial Credit* • Fully correctly substituted Pythagoras Theorem • Error(s) in substituting in Pythagoras Theorem, but correctly evaluates each side *Full Credit –1* • Stops at 56.25 = 20.25 + 36
(b) (iii)	$A = \frac{1}{2}bh$ $A = \frac{1}{2} \times 6 \times 4.5$ $A = 13.5$ cm^2	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Correct substitution relevant formula • Indicates multiplication of two relevant numbers *High Partial Credit* • Fully correctly substituted formula • Finds area of rectangle with work shown *Full Credit –1* • Value correct but no or incorrect unit

Q11	Model Solution – 50 Marks	Marking Notes
(a) (i) (ii)	€480 8	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Work of merit, for example, relevant work on the graph *High Partial Credit* • One part correct
(a) (iii)	$1920 \div 8 = €240$	**Scale 5B (0, 2, 5)** *Partial Credit* • Work of merit, for example, 1920 divided by a number, or indicates 2-month reduction $(1920 - 1440)$, or indicates 8 [months]
(b) (i)	1120 960 800 640	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, shows difference between two successive terms, or finds 1 more term *High Partial Credit* • 2 terms correct
(b) (ii)	*Correct line drawn*	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, plots one or two points correctly *High Partial Credit* • 3, 4, or 5 points correctly plotted *Full Credit –1* • Plots all points correctly, but doesn't join with a line • 6 of the 7 points correctly plotted and joined with a line
(b) (iii)	4	**Scale 5B (0, 2, 5))** *Partial Credit* • Some work of merit, for example, highlighted on graph

Q11	Model Solution – 50 Marks	Marking Notes
(c)	$2100 \div 300 = 7$ months $1540 \div 7 = €220$ **OR** $\frac{300}{2100} \times 1540 = €220$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit* • Some work of merit, for example, indicates $2100 \div 300$, or starts subtracting 300 in a list *High Partial Credit* • Finds 7 months
(d)	$0.15 \times 45 = 6.75$ $45 - 6.75 = €38.25$ **OR** $45 \times 0.85 = €38.25$	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, relevant use of 100 *High Partial Credit* • Finds 6.75 • 45×0.85
(e)	$40, 80, 120, 160, 200$ …. $50,100,150,200,$ …… 200 mins = 3 hrs and 20 mins $9{:}00 + 3{:}20 = 12{:}20$ **OR** $9.00, 9.40, 10.20, 11.00,$ $11.40, \mathbf{12.20}$, … $9.00, 9.50, 10.40, 11.30, \mathbf{12.20}$, .. Answer: 12:20	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, finds a relevant time (other than those given) *High Partial Credit* • Calculates 200 mins • Writes at least 3 correct times for each person *Full Credit –1* • Answer not written from two correct lists