

MARKING SCHEME
LEAVING CERTIFICATE APPLIED, 2007

MATHEMATICAL APPLICATIONS

GENERAL GUIDELINES FOR EXAMINERS

1. Penalties of three types are applied to candidates' work as follows:

- Blunders - mathematical errors/omissions (-3)
- Slips - numerical errors (-1)
- Misreadings (provided task is not oversimplified) (-1).

Frequently occurring errors to which these penalties must be applied are listed in the scheme. They are labelled as B1, B2, B3,....., S1, S2, S3,....., M1, M2, etc. Note that these lists are not exhaustive.

2. When awarding attempt marks, e.g. Att(3), it is essential to note that

- any correct relevant step in a part of a question merits *at least* the attempt mark for that part
- if deductions result in a mark which is lower than the attempt mark, then the attempt mark must be awarded
- a mark between zero and the attempt mark is never awarded.

3. Worthless work is awarded zero marks. Some examples of such work are listed in the scheme and they are labelled as W1, W2,.....etc.

4. The *same* error in the *same* section of a question is penalised *once* only.

5. Special notes relating to the marking of a particular part of a question are indicated by an asterisk. These notes immediately follow the box containing the relevant solution.

6. Particular cases, verifications and answers derived from diagrams (unless requested) qualify for attempt marks only.

7. The phrase “and stops” means that no more work of merit is shown by the candidate.

QUESTION 1

Part (a)	5 marks	Att 2
Part (b)	5 marks	Att 2
Part (c)	5 marks	Att 2
Part (d)	5 marks	Att 2
Part (e)	5 marks	Att 2
Part (f)	5 marks	Att 2
Part (g)	5 marks	Att 2
Part (h)	5 marks	Att 2
Part (i)	5 marks	Att 2
Part (j)	5 marks	Att 2

Part (a) **5 marks** **Att 2**

Calculate $\sqrt{99}$, correct to two decimal places

(a) **5marks** **Att 2**

(a) $\sqrt{99} = 9.949874371$
 $= 9.95$

* Accept correct answer with no work.

Blunders(-3)

B1: Answer = $(99)^2 = 9801$.

B2: Answer = $99 \div 2 = 49.5$.

B3: Misplaced decimal.

Slips (-1)

S1: Failure to round or incorrect rounding.

Misreading(-1)

M1: Gets $\sqrt[3]{99}$

Attempts(2 marks)

A1: Answer = $99 \times 2 = 198$

Worthless(0)

W1: Answer = 99 ± 2 .

Part (b)

5 marks

Att 2

A child is prescribed 2.5 ml of medicine three times a day for five days. Calculate the total amount of medicine needed.

(b)

5 marks

Att 2

(b) $2.5 \text{ ml} \times 3 \times 5 = 37.5 \text{ ml}$

- * Accept correct answer with no work.
- * Accept answer = 37.5

Blunders(-3)

B1: Divides instead of multiplying (answer = 0.16666666 ml)

B2: Ignores the 3 or the 5 in calculating (answer = 7.5 ml or answer = 12.5 ml).

B3: Misplaced decimal.

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Incorrect units.

Attempts(2)

A1: Answer = $2.5 \text{ ml} \pm 3 \pm 5$

A2: Answer = $2.5 \text{ ml} \pm 5$

A3: Answer = $2.5 \text{ ml} \pm 3$.

Worthless(0)

W1: Answer = 2.5 ml.

Part (c)

5 marks

Att 2

An airplane leaves Cork airport at 22:50. It arrives in Glasgow airport one hour and forty minutes later. At what time does the airplane arrive in Glasgow?

(c)

5marks

Att 2

(c) $22:50 + 01:40 = 24:30$ or 30 minutes after midnight
 $= 00:30$

- * Accept correct answer with no work.
- * Accept answer = half past twelve at night
- * Accept answer = 12:30 am

Blunders(-3)

B1: One hour = 100 minutes .(23:90)

B2: Subtracts one hour and forty minutes(answer = 21:10)

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Answer = half past 12 or 12:30 and stops.

S3: Answer = 24:30 and stops plus S2.

Attempts(2)

A1: No work shown and answer = 12 plus any minutes not mentioned above **or**.
Answer = 23 plus any minutes not mentioned above **or**
Answer = 22:50 plus any minutes not mentioned above.

Worthless(0)

W1: Answer = 22:50 and stops.

Part (d)

5 marks

Att 2

An athlete runs 100 metres in 10 seconds. Calculate his average speed in kilometres per hour.

(d)

5marks

Att 2

(d)	100 m in 10 secs	or	100 m in 10 secs
	=> 600 m in 60 secs	=>	10 m in 1 sec
	=> 600 m in 1 min	=>	$10 \times 60 \times 60$ in $1 \times 60 \times 60$
	=> 36000 m in 60 min	=>	36000 m in 3600 sec
	=> 36 km in 1 hour	=>	36 km in 1 hour

* Accept correct answer with no work.

Blunders(-3)

B1: One minute = 100 sec

B2: One hour = 100 minutes.

B3: One km \neq 1000 metres.

B4: One hour = 60 secs

B5: Ignores sec or minutes in calculating

B6: Divides instead of multiplying in calculating(answer = .000027777777 km)

B7: Misplaced decimal

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Incorrect or omitted units.

S3: Correct answer in incorrect units.

Attempts(2)

A1: 1 minute = 60 sec and stops.

A2: 1 hour = 3600 sec and stops.

A3: Answer = 10 m and stops

A4: Answer = $100 \times 10 = 1000$ km per hour.

A5: Correct speed formula given only.

Worthless(0)

W1: Answer = 100 m stops

Part (e)

5 marks

Att 2

The price of a jacket is €50. During a sale the price is reduced by 15%. Calculate the sale price of the jacket.

(e)

5marks

Att 2

$$\begin{aligned} \text{(e)} \quad & \text{€}50 - (\text{€}50 \times 15\%) \quad \text{or} \quad \text{€}50 \times 85\% \\ & = \text{€}50 - (\text{€}7.50) \quad \quad \quad \text{€}42.50 \\ & = \text{€}42.50 \end{aligned}$$

* Accept correct answer with no work

Blunders(-3)

B1: Inverts €50 (answer = €0.017).

B2: Inverts 15% (answer = € 283.33)

B3: Misplaced decimal.

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Failure to round or incorrect rounding.

S3: Incorrect units.

S4: Answer = €7.50 and stops plus S5

S5: Calculates 115% (answer = €57.50)

Attempts(2)

A1: Answer = € 50 ± 15 and stops

A2: €50 decreased by any relevant number not covered above.

A3: Answer = 0.15 and stops.

(f)

5 marks

Att 2

Given an exchange rate of €1 = \$1.13, convert \$350 to euro.

(f)

5 marks

Att 2

$$\begin{aligned} \text{(f)} \quad & \$350 \div \text{€}1.13 = \text{€} 309.7345133 \\ & = \text{€} 309.73 \end{aligned}$$

* Accept correct answer with no work

Blunders(3)

B1: Answer = €1.13 × \$350 = € 395.50.

B2: Inverts \$350 (€0 .002528)

B3: Misplaced decimal.

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Failure to round or incorrect rounding.

S3: Omitted or incorrect units

Attempts(2)

A1: Answer = \$350 ± 1.13.

Worthless (0)

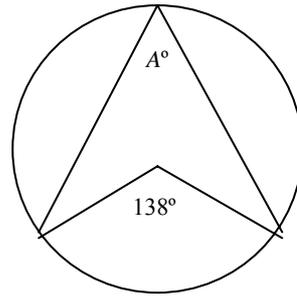
W1: Answer = \$350.

Part (g)

5 marks

Att 2

Calculate A.



(g)

5 marks

Att 2

$$\begin{aligned} \text{(g)} \quad A &= 138^\circ \div 2 \\ &= 69^\circ \end{aligned}$$

* Accept correct answer with no work.

Blunders(-3)

B1: Answer = $138^\circ \times 2 = 276^\circ$.

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Incorrect or omitted units.

S3: Applies incorrect geometric relationship.

Attempts(2)

A1: Answer = 90° or 180° or 360° without work.

A2: Answer = 50° with no work (measurement from examination paper)..using tolerance $\pm 5^\circ$.

Worthless(0)

W1: Answer = 138° and stops.

Part (h)

5 marks

Att 2

The weights of five students are 45.6 kg, 47.1 kg, 43.7 kg, 44.6 kg and 50.6 kg. Calculate the average weight of the five students.

(h)

5marks

Att 2

$$(h) \text{ Average weight} = \frac{45.6 + 47.1 + 43.7 + 44.6 + 50.6}{5} = \frac{231.6}{5} = 46.32 \text{ kg}$$

* Accept correct answer with no work.

Blunders(-3)

B1: Misplaced decimal.

B2: Multiplies the total by 5(answer = 1158 kg).

B3:Omission of division(answer = 231.6 kg).

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Incorrect or omitted units

S3: List evident....each height omitted to a max of -3.

S4: Truncates answer to 46 kg.

Attempts(2)

A1: Any indication of addition.

A2: Multiplies one of the weights by 5.

Worthless(0)

W1: Multiplies weights only.

W2: Answer = 5.

Part (i)

5 marks

Att 2

A box contains 50 raffle tickets, each having a different whole number from 1 to 50. If a ticket is drawn at random, what is the probability that the number chosen is less than 10?

(i)

5marks

Att 2

(i)

$$\frac{9}{50}$$

* Accept answer written as 9:50, 9 in 50, 9 out of 50, or 0.18

Blunders(-3)

B1: No fraction or ratio set up.

B2: Answer = 9 + B1.

B3: Answer = 50 + B1.

B4: Answer = $\frac{50}{9}$

B5: Answer = $\frac{1}{50}$.

B6: Answer = 9 to 50.

Slips(-1)

S1: Truncates decimal answer.

S2: Answer = $\frac{10}{50}$

Attempts(2)

A1: Any proper fraction other than $\frac{9}{50}, \frac{1}{50}, \frac{50}{9}$.

A2: Answer = 9 - 50

Part (j)

5 marks

Att 2

Convert 15° Celsius to degrees Fahrenheit using the formula: $F = C \times \frac{9}{5} + 32$

(j)

5marks

Att 2

$$\begin{aligned} \text{(j)} \quad F &= 15 \times \frac{9}{5} + 32 \\ &= 27 + 32 \\ &= 59^\circ \end{aligned}$$

* Accept correct answer with no work.

Blunders(-3)

B1: Ignores order of operations(answer = 507°) .

B2: Mishandles or ignores $\frac{9}{5}$.

B3: Misplaced decimal..

B4: Correct substitution and stops + B1 + possible B2.

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Incorrect or omitted units.

Misreadings(-1)

M1: Converts 15° Fahrenheit to degrees Celsius.

Attempts(2)

A1: Substitution for C correct or incorrect and stops.

QUESTION 2

Part (a)	(5, 5) marks	Att (2, 2)
Part (b)	10 marks	Att 3
Part (c)	(10, 10) marks	Att (3,3)
Part (d)	10 marks	Att 3

Part (a) **(5, 5) marks** **Att (2,2)**

Measure the internal length and width of the drawing of the kitchen, as it is shown in the diagram.
Length.....cm
Widthcm

(a)(i) **5 marks** **Att 2**

(a)(i) Length = 15 cm

* Tolerance ± 0.1 cm

Blunders(-3)

B1: Answer = number of blocks (30)

B2: Length measured outside outside tolerance of 0.5 cm.

Slips(-1)

S1: Side measured between tolerance of 0.1 cm and 0.5 cm.

Misreadings(-1)

M1: Measurement in inches

M2: Measures the external length (answer = 17 cm)

(a)(ii) **5 marks** **Att 2**

(a)(ii) Width = 10 cm

* Tolerance ± 0.1 cm

Blunders(-3)

B1: Answer = number of blocks (20) if not applied in part a(i)

B2: Length measured outside outside tolerance of 0.5 cm.

Slips(-1)

S1: Side measured between tolerance of 0.1 cm and 0.5 cm.

Misreadings(-1)

M1: Measurement in inches

M2: Measures the external length (answer = 12 cm) if not already applied in part a(i)

NOTE: Candidate may give answer for length as answer for the width and vice versa.

Part (b)**10 marks****Att 3**

Using the scale of 1 to 20, write down the actual measurements of the kitchen, in metres.

Length.....m

Width.....m

(b)**10 marks****Att 3**

(b)	Length = 15 cm × 20	and	Width = 10 cm × 20
	= 300 cm		= 200 cm
	= 3 m		= 2 m

* Accept correct answer with no work.

* Accept candidates answers for part (a)(i) and (a)(ii)

Blunders(-3)

B1: Divides by 20.

B2: 1 metre ≠ 100 cm.

B3: Correct answer for the length or width only.

B4: Misplaced decimal.

Slips(-1)

S1: Each numerical error to a max. of -3.

Attempts(3)

A1: Answer length = 16 m(1+15), width = 30 m(20 +10)

Worthless(0)

W1: Ignores answers for parts (a)(i) and (a)(ii) and gives length =1 and width = 20

W2: Answer length = 1500 m , width = 1000 m and stops

Part (c)**(10,10) marks****Att (3, 3)**

A fridge, a sink unit, and other kitchens units are to be fitted. The sink unit measures 100 cm by 60 cm. The fridge measures 60 cm by 60 cm. Draw the sink unit and the fridge in suitable locations on the above diagram, using the correct scale.

(c)(i)**10marks****Att 3**

(c)(i) Using the scalesink unit = 5 cm × 3 cm (10 blocks by 6 blocks)

* Tolerance = ± 0.1 cm

* Accept correct answers with no work.

Blunders(-3)

B1: Incorrect size.

B2: Inappropriate position

Slips(-1)

S1: Sink unit not labeled.

Attempts(3)

A1: A section of the drawing labeled but not drawn in.

(c)(ii)

10marks

Att 3

(c)(ii) Using the scalefridge unit = 3 cm × 3 cm (6 blocks by 6 blocks)

* Tolerance = ± 0.1 cm

* Accept correct answers with no work.

Blunders(-3)

B1: Incorrect size..

B2: Inappropriate position

Slips(-1)

S1: Fridge unit not labeled.

Attempts(3)

A1: A section of the drawing labeled but not drawn in.

Part (d)

10 marks

Att 3

The remaining suitable spaces will contain units covered with countertop. The countertop is 60 cm deep. Complete your plan by drawing in the countertop.

(d)

10marks

Att 3

(d) Using the scale.....countertop = 3 cm (6 blocks)

* Accept correct answer with no work

* Accept candidates answer from (c)

Blunders(-3)

B1: Incorrect size.

B2: Inappropriate position.

Slips(-1)

S1: Not using all suitable places, having marked in one counter top

Worthless(0)

W1: A section of the drawing labeled 'countertop' but not drawn in.

QUESTION 3

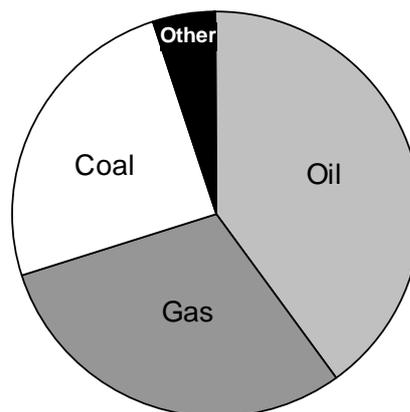
Part (a)	10 marks	Att 3
Part (b)	10 marks	Att 3
Part (c)	5 marks	Att 2
Part (d)	15 marks	Att 5
Part (e)	10 marks	Att 3

Part (a)	10 marks	Att 3
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(a) In the box below, draw a pie chart to illustrate this data.

(a)	10marks	Att 3
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Oil... $.40\% \times 360^\circ = 144^\circ$
 Gas... $.30\% \times 360^\circ = 108^\circ$
 Coal... $.25\% \times 360^\circ = 90^\circ$
 Other... $.5\% \times 360^\circ = 18^\circ$



* Tolerance $\pm 5^\circ$

* Accept correctly drawn pie chart without work.

Blunders(-3)

B1: Uses 180° in calculating the angle sizes

B2: Inverts 360° .

B3: Mishandling of percentages (e.g. $40\% = \frac{100}{40}$).

B4: Misplaced decimal.

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Omission or incorrect labeling only if all else correct.

Attempts(3)

A1: Pie chart drawn free hand.

A2: Bar chart or trend graph drawn.

A3: Uses percentages as degree measurements in the pie chart.

A4: Calculates the degree measurements only.

A5: Pie chart drawn with incorrect angle measurements and no work, and not covered above.

NOTE:

Correct the answer using the following :

Circle drawn only = 3 marks

Circle with 4 divisions = 7 marks

Circle with 4 divisions and one of these correct = 8 marks

Circle with 4 divisions and two of these correct = 9 marks.

Circle with all 4 divisions correct plus labels = 10 marks

Part (b)

10 marks

Att 3

If 200 families used oil, calculate the total number of families that were surveyed.

(b)

10 marks

Att 3

(b)	Oil = 40% = 200	or	1 44° = 200
	$\Rightarrow 1\% = \frac{200}{40}$		$\Rightarrow 1^\circ = \frac{200}{144}$
	$\Rightarrow 100\% = \frac{200}{40} \times 100$		$\Rightarrow 360^\circ = \frac{200}{144} \times 360$
	$\Rightarrow 100\% = 500$ families		$\Rightarrow 360^\circ = 500$ families

* Accept correct answer with no work.

* Accept candidate's answer for part (a)

Blunders(-3)

B1: Inverts $\frac{200}{40}$.

B2: Fails to multiply by 360°

B3: Misplaced decimal .

B4: Answer = $200 \times 5 = 1000$ families

B5: Inverts $\frac{100}{40}$ (answer = 80)

Slips(-1)

S1: Each numerical error to a max of -3.

Misreading(-1)

M1: Uses gas, or coal or other in calculating.

Attempts(3)

A1: Any answer greater than 200 not covered above.

Worthless(0)

W1: Answer = 200 with no work..

Part (c)

5 marks

Att 2

The average cost of a barrel of crude oil in 2000 was \$26.58. This cost increased to \$56.17 in 2006. Calculate the percentage increase.

(c)

5 marks

Att 2

$$\begin{aligned}\text{Increase} &= \$56.17 - \$26.58 = \$29.59 \\ \text{\% Increase} &= \frac{\$29.59}{\$26.58} \times 100 \\ &= 111.324304\%\end{aligned}$$

* Accept correct answer with no work.

Blunders(-3)

B1: Adds to calculate the increase.(311.324304%)

B2: Ignores increase + B1(211.324304%)

B3: Inverts $\frac{\$29.59}{\$26.58}$.(89.82764447%).

B4: Uses the increased cost in calculating the % increase (52.67936621%)

B5: Misplaced decimal.

Slips(-1)

S1: Each numerical error to a max of -3.

S2: Incorrect units.

S3: Truncates or rounds the answer.

Attempts(2)

A1: Answer = \$56.17 ± \$26.58 only.

A2: Answer greater than 100% not covered above..

Worthless (0)

W1: Answer = 100% and stops.

W2: Answer = 56.17 × 26.58 and stops

Part (d)

15 marks

Att 5

(d) In an election the total poll was 49 230. The number of spoiled votes was 630. Calculate the valid poll.

(d)

15 marks

Att 5

$$\begin{aligned}\text{Valid Poll} &= 49\,230 - 630 \\ &= 48\,600\end{aligned}$$

* Accept correct answer with no work

Blunders(-3)

B1: Adds instead of subtracts (49 860)

B2: Answer = 630 -49230 = 49400

Slips(-1)

S1: Each numerical error to a max. of -3

Attempts(5)

A1: Answer = 49 230 × 630 (31014900)

A2: Answer = 630 or answer = 49230.

A2: Answer = 49230 ÷ 630 = 78.14285.

Part (e)

10 marks

Att 3

In this election four seats have to be filled. Calculate the quota, using the given formula.

(e)

10 marks

Att 3

$$\begin{aligned} \text{(e) quota} &= \frac{\text{valid poll}}{\text{number of seats} + 1} + 1 \\ &= \frac{48600}{4+1} + 1 \\ &= 9720 + 1 \\ &= 9721 \end{aligned}$$

* Accept correct answer with no work

* Accept candidate's answer from part (d)

Blunders(-3)

B1: Ignores the second +1 in the formula (9720).

B2: Incorrect substitution unless S2.

B3: Mishandles the lower line,e.g.quota = $(48600 \div 4)+1+1 = 12152$.

B4: Correct substitution and stops plus B1 and B3.

B5: Misplaced decimal

Slips(-1)

S1: Each numerical error to a max of -3

S2: Number of seats $\neq 4$

S3: Incorrect rounding or failure to round.

Attempts(3)

A1: One substitution, correct or incorrect, into formula and stops..

QUESTION 4

Part (a) (5, 5, 5, 5, 5, 5, 5, 5) marks Att (2, 2, 2, 2, 2, 2, 2, 2, 2)
Part (b) 10 marks Att 3

Part (a) (5, 5, 5, 5, 5, 5, 5, 5) marks Att (2, 2, 2, 2, 2, 2, 2, 2, 2)

Fill in the missing details on this telephone bill:

Section B

Call Charges

<i>type of call</i>	<i>rate per min</i>	<i>duration(hr:min:sec)</i>	<i>cost</i>
Local	4.83 cent	01:54:00	<input type="text"/>
National	<input type="text"/>	02:30:00	11.10
To Mobiles	22.06 cent	00:38:03	8.39
<i>Total call charges</i>			<input type="text"/>

Your bi-monthly telephone bill

Recurring charges <i>see section A</i>	42.26
Call Charges <i>see section B</i>	<input type="text"/>
Charges for this period	<input type="text"/>
Vat on € <input type="text"/> at 21%	<input type="text"/>
Total bill	€ <input type="text"/>

(a)(i) 5 marks Att 2

<p>(a)(i) Local call cost = $4.83 \text{ c} \times 114 \text{ min}(1 \text{ hr } 54 \text{ min})$ $= 550.62 \text{ cent}$ $= €5.51$</p>
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* Accept correct answer with no work

Blunders(-3)

B1: Misplaced decimal.

B2: Divides 114 (0.04236)

B3: 1 hour = 100 minutes.(€7.44)..applied once only in Q4(a)

B4: Rounds cost per min before multiplying(€5.70)

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Failure to round or incorrect rounding.

S3: Failure to convert cent to euro.

Attempts(2)

A1: Answer = 4.83 ± 114 correct or incorrect

A2: Answer = 4.83 ± 154 correct or incorrect.

(a)(ii)

5 marks

Att 2

$$\begin{aligned} \text{(a)(ii) National rate per min} &= \frac{1110\text{cent}}{150\text{min}} \\ &= 7.4\text{ cent} \end{aligned}$$

* Accept correct answer with no work

Blunders(-3)

B1: Misplaced decimal.

B2: Multiplies instead of dividing by 150 (166500)

B3: 1 hour = 100 mins (4.83)..Do **not** apply if already applied in (a)(i)

B4: Inverts $\frac{1110\text{cent}}{150\text{min}}$ (0.13)

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Failure to round or incorrect rounding.

Misreadings(-1)

M1: Uses duration for local or mobiles

M1: Uses cost of locals or cost of mobiles.

Attempts(2)

A1: Answer = 1110 ± 150 , correct or incorrect.

A2: Answer = 1110 ± 230 , correct or incorrect.

(a)(iii)

5 marks

Att 2

$$\text{(a)(iii) Total call charges} = \text{€ } 5.51 + 11.10 + 8.39 = \text{€}25.00$$

* Accept correct answer with no work

* Accept candidate's answer for part a(i)

Blunders(-3)

B1: Misplaced decimal.

B2: Each cost omitted.

B3: Subtracts instead of adds.

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Failure to round or incorrect rounding.

S3: Adds in total recurring charges.(€67.26)

Misreadings(-1)

M1: Part(iii) blank but correct answer in part (iv)

Attempts(2)

A1: Answer = total of the rates.(34.29 c)

(a)(iv)

5 marks

Att 2

(a)(iv) Call charges for Section B = € 25.00

* Accept candidate's answer for part a(iii)

Blunders(-3)

B1: Each excess cost.

Attempts(2)

A1: Any relevant number not covered above..

(a)(v)

5 marks

Att 2

(a)(v) Charges for this period = €42.26 + €25.00
= € 67.26

* Accept candidate's answer for part a(iii) and part a(iv)

Blunders(-3)

B1: Each excess cost.

B2: Omits a cost

B3: subtracts instead of adds (17.26)

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Failure to round or incorrect rounding.

Misreadings(-1)

M1: Part(v) blank but correct answer in part (vi)

(a)(vi)

5 marks

Att 2

(a)(vi) VAT on € 67.26

* Accept candidate's answer for part a(v)

Blunders(-3)

B1: Answer = recurring charges or call charges from section B

Attempts(2)

A1: Any relevant number from table not covered above.

Misreadings(-1)

M1: Swaps answers for part a(vi) and a(vii)

M2: Answer = 121%

(a)(vii)

5 marks

Att 2

(a)(vii)	$\text{Vat} = \text{€ } 67.26 \times 21\%$ $= \text{€}14.12$
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* Accept candidate's answer for part a(vi)

* Accept correct without work.

Blunders(-3)

B1: Inverts 67.26(0.00312)

B2: Inverts 21% (320.28)

B3: Misplaced decimal

Slips(-1)

S1: Each numerical error to a max of -3

S2: Failure to round or incorrect rounding.

S3: Evaluates 121%(81.38)

Attempts(2)

A1: Calculates 21% of a relevant number.

(a)(viii)

5 marks

Att 2

(a)(viii)	$\text{Total Bill } \text{€ } 67.26 + \text{€ } 14.12 = \text{€ } 81.38$
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* Accept candidate's answer for part a(vi)

* Accept correct without work.

Blunders(-3)

B1: Each cost omitted

B2: Each excess cost.

B3: Subtracts instead of adds(53.14)

B4: Misplaced decimal.

Slips(-1)

S1: Each numerical error to a max of -3

S2: Failure to round or incorrect rounding

Misreadings(-1)

M1: 121% filled in part (vii) and part (viii)

M2: Part (vii) blank but correct in part (viii)

NOTE: 121% filled in part (vii), is misreading of -1, and part (viii) blank is 0 marks for part (viii).

Part (b)

10 marks

Att3

A solid metal cylinder has diameter 1.5 cm and height 4 cm. Calculate the volume of metal in the cylinder, taking $\pi = 3.14$

(b)

10 marks

Att 3

$$\begin{aligned} \text{(b) Volume of cylinder} &= \pi r^2 h \\ &= 3.14 \times \frac{1.5}{2} \times \frac{1.5}{2} \times 4 \\ &= 3.14 \times 0.75 \times 0.75 \times 4 \\ &= 7.065 \text{ cm}^3 \end{aligned}$$

* Accept correct answer with no work.

* Accept volume using $\pi = \frac{22}{7}$ (7.071428)

* Accept answer = 7.068583471(using π button on the calculator)

Blunders(-3)

B1: r = diameter(28.26)

B2: Mishandling of r^2 (e.g. 2r for $r^2=18.84$)

B3: Fails to substitute for π and continues(2.25 π)

B4: Ignores height and continues(1.76625)

B5: Volume = $\pi h + B2$.(12.56) + B1

B6: Misplaced decimal.

B7: Correct substitution and stops + possible B2.

B6: Volume = $\frac{\pi}{r^2 h}$ (1.395555555)

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Omitted or incorrect units applied to correct answers only

Misreadings(-1)

M1: r = h.(200.96)

Attempt(3)

A1: Only one substitution correct or incorrect and stops.

A2: Adds the dimensions only.

QUESTION 5

Part (a)	20 marks	Att 7
Part (b)	13 marks	Att 4
Part (c)	5 marks	Att 2
Part (d)	10marks	Att 3
Part (e)	2 marks	Att 1

Part (a)	20 marks	Att 7
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Calculate Gemma's basic hourly rate

(a)	0 marks	Att 7
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$$\begin{aligned} \text{(a)} \quad \text{Basic rate} &= \frac{€532.60}{35} = €15.21714286 \\ &= € 15.22 \text{ per hour} \end{aligned}$$

* Accept correct without work.

Blunders(-3)

B1: Multiplies instead of divides (€18641)

B2: Answer = €2.17 (€532.60 ÷ 35 ÷ 7).

B3: Inverts $\frac{€532.60}{35}$ (0.065)

B4: Misplaced decimal

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Failure to round or incorrect rounding

Attempts(7)

A1: Answer = €532.60 ±35, correct or incorrect

Part (b)

13 marks

Att 4

Gemma works $5\frac{1}{2}$ hours overtime. The overtime rate is double the basic rate. How much does she earn for the $5\frac{1}{2}$ hours overtime?

(b)

13 marks

Att 4

$$\begin{aligned} \text{(b) Overtime rate} &= \text{€ } 15.22 \times 2 = \text{€}30.44 \\ 5\frac{1}{2} \text{ hours o/t} &= \text{€}30.44 \times 5\frac{1}{2} \\ &= \text{€}167.42 \end{aligned}$$

* Accept correct without work.

* Accept candidate's answer for part (a)

Blunders(-3)

B1: Divides by 2 for o/t rate (7.61)

B2: Divides by 5.5 hours (5.53).

B3: Having calculating the o/t rate fails to calculate for 5.5 hours + B2.

B4: Ignores the o/t rate + B1(83.71)

B5: Misplaced decimal

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Failure to round or incorrect rounding

Attempts(4)

A1: Answer $15.22 \pm 2 \pm 5.5$, correct or incorrect.

Worthless(0)

W1: Answer = €15.22

Part (c)

5 marks

Att 2

Gemma gets a 4% pay rise. Calculate her income for a $40\frac{1}{2}$ hour week, after the pay rise.

(c)

5 marks

Att 2

(c) Pay for $40\frac{1}{2} = €532.60 + €167.42$
= € 700.02
4% Pay rise = €700.02 × 104% or (€700.02 × 4%) + €700.02
= €728.02 = €28.00 + €700.02
= €728.02

* Accept correct answer with no work

* Accept candidate's answer from part (b).

Blunders(-3)

B1: Ignores or mishandles either the basic pay or o/t pay for $40\frac{1}{2}$ hour week and continues.

B2: Inverts 4% or 104%.

B3: Inverts €700.02(.00148)

B4: Misplaced decimal.

B5: Answer = €28.00 and stops + S3.

Slips(-1)

S1: Each numerical error to a max of -3.

S2: Failure to round or incorrect rounding

S3: Calculates 96%. (€672.02)

Misreading (-1)

M1: Pay rise ≠ 4%.

Attempt(2)

A1: Answer = pay for $40\frac{1}{2}$ hour week only.

A2: Answer = $40\frac{1}{2} \times 104\%$.

Part (d)

10 marks

Att 3

There are four teams in Pool A of a rugby championship. Each team plays each of the other teams exactly twice. How many matches are played in Pool A?

(d)

10 marks

Att 3

(d) 12 matches

* Accept correct answer with no work

Blunders(-3)

B1: Answer = 6. = (3+2+1) × 1

B2: Answer = 48 = (12 × 4).

B3: Answer = 24, with or without work.

B4: Omits one or two of these in calculations (3+2+1) × 2

Slips(-1)

S1: Each numerical error to a max of -3.

S2: Counting error with work shown.

Attempt(3)

A1: Attempt at grid or counting.

A2: Answer = $2^4 = 16$

A3: Any other multiple of 12 not covered above.

Part (e)

2 marks

Att 1

There are SIX pools in this championship. After the pool stage, EIGHT teams go forward to a knock-out stage, consisting of quarter finals, semi-finals, and a final. How many matches are played in total during the championship, assuming that there are no replays?

(e)

2 marks

Att 1

(e) Number of matches = $(12 \times 6) + 4 + 2 + 1$
= $72 + 7$
= 79

* Accept correct answer with no work

* Accept candidate's answer for part (d)

Blunders(-3)

B1: Ignores or mishandles 6.

B2: Omits 1 or 2 in calculating the number of quarter finals, semi finals and final. (4+2+1 = 7)

B3: Answer = 504 = 72×7 .

B4: Ignores the pool matches + possible B1.

B5: Answer = 158 = 79×2 .

B6: Answer = 80 = $72 + (4 \times 2 \times 1)$

Slips(-1)

S1: Each numerical error to a max of -3.

S2: Counting error with work shown.

Attempt(1)

A1: Answer = $6 \times 8 = 48$.

A2: Attempt at grid or counting.

Marcanna Breise as ucht freagairt trí Ghaeilge (Bonus marks for answering through Irish)

Ba chóir marcanna de réir an ghnáthráta a bhronnadh ar iarrthóirí nach ngnóthaíonn thar 75% d'iomlán na marcanna don pháipéar. Ba chóir freisin an marc bónais sin a shlánú **síos**.

Is é 5% an gnáthráta agus is é 200 iomlán na marcanna. Mar sin, bain úsáid as an ngnáthráta 5% i gcás marcanna suas go 150. (e.g. $118 \text{ marks} \times 5\% = 5.9 \Rightarrow \text{bónas} = 5 \text{ marc.}$)

Thar 150, is féidir an bónas a ríomh de réir na foirmle seo: $[200 - \text{bunmharc}] \times 15\%$, (agus an marc sin a shlánú **síos**). In ionad an ríomhaireacht sin a dhéanamh, is féidir úsáid a bhaint as an tábla thíos.

Bunmharc	Marc Bónais
151 – 153	7
154 – 160	6
161 – 166	5
167 – 173	4
174 – 180	3
181 – 186	2
187 – 193	1
194 – 200	0

Table of Credits

The following table shows the mark range associated with each number of credits:

Credits	Mark range
10	180 – 200
9	162 – 179
8	144 – 161
7	126 – 143
6	108 – 125
5	90 – 107
4	72 – 89
3	54 – 71
2	36 – 53
1	18 – 35
0	0 – 17