



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

# **JUNIOR CERTIFICATE 2008**

## **MARKING SCHEME**

### **MATHEMATICS**

#### **FOUNDATION LEVEL**

## 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: B1, B2, B3, ..., S1, S2, ..., M1, M2, ...etc. These lists are not exhaustive.

2. When awarding attempt marks, e.g. Att(3), 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 phrase "hit or miss" means that partial marks are not awarded – the candidate receives all of the relevant marks or none.

5. The phrase "and stops" means that no more work is shown by the candidate.

6. 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.

7. The sample solutions for each question are not intended to be exhaustive lists – there may be other correct solutions.

8. Unless otherwise indicated in the scheme, accept the best of two or more attempts – even when attempts have been cancelled.

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

10. Particular cases, verifications and answers derived from diagrams (unless requested) qualify for attempt marks at most.

11. A serious blunder, omission or misreading results in the attempt mark at most.

12. Do not penalise the use of a comma for a decimal point, e.g. €5.50 may be written as €5,50.

## QUESTION 1

<b>Part (a)</b>	<b>10 (5,5) marks</b>	<b>Att 4 (2,2)</b>
<b>Part (b)</b>	<b>20 (5,5,5,5) marks</b>	<b>Att 8 (2,2,2,2)</b>
<b>Part (c)</b>	<b>20 (10,10) marks</b>	<b>Att 6 (3,3)</b>

**Part (a)** **10 (5,5) marks** **Att 4 (2,2)**

(i)  $85 + 49 =$

(ii)  $85 \times 49 =$

**(a)** **5 Marks** **Att 2**

(i) 134

\* Accept correct answer without work

\* Mark both parts (i) and (ii) independently.

*Blunders (-3)*

B1 Uses incorrect operator (with work)

*Slips (-1)*

S1 Arithmetic error in calculation (once only) – work shown

S2 Decimal error

*Misreadings (-1)*

M1 Error in copying down a digit (once only)

*Attempts (2 marks)*

A1 Any att. at addition [Evidence of operation – only one correct digit written down]

A2 Special Cases: 36 ( - ), 1·734 ( ÷ ), 4165 ( × ), or similar (without work)

*Worthless (0)*

W1 Incorrect answer without work

**(a)** **5 Marks** **Att 2**

(ii) 4165

\* Accept correct answer without work

\* Mark both parts (i) and (ii) independently.

*Blunders (-3)*

B1 Uses incorrect operator (with work)

*Slips (-1)*

S1 Arithmetic error in calculation (once only) – work shown

S2 Decimal error

*Misreadings (-1)*

M1 Error in copying down a digit (once only)

*Attempts (2 marks)*

A1 Any att. at multiplication [Evidence of operation – only one correct digit written down]

A2 Special Cases: 134 ( + ), 1·734 ( ÷ ), 36 ( - ), or similar (without work)

*Worthless (0)*

W1 Incorrect answer without work

**Part(b)**

**20 (5,5,5,5)marks**

**Att 8 (2,2,2,2)**

**(i)**  $348 \div 6 =$

**(ii)**  $7 + 8(6 - 2) =$

**(iii)**  $5^2 =$

**(iv)**  $\sqrt{81} =$

**(b)(i)**

**5 marks**

**Att 2**

**(i)**  $58$

\* Accept correct answer without work

*Blunders (-3)*

B1 Uses incorrect operator (with work)

*Slips (-1)*

S1 Arithmetic error in calculation (once only) – work shown

S2 Decimal error

*Misreadings (-1)*

M1 Error in copying down a digit (once only)

*Attempts (2 marks)*

A1 Any attempt at division [Evidence of operation – at least one correct digit]

A2 Special cases:  $0.001724\dots$  ( $6 \div 348$ ), -342, 354, 2088 (with/without work)

*Worthless (0)*

W1 Incorrect answer without work

**(b)(ii)**

**5 marks**

**Att 2**

**(ii)**  $7 + 8(4) = 7 + 32 = 39$

\* Accept correct answer without work

*Blunders (-3)*

B1 Uses incorrect operator (with work)

B2 Incorrect order

B3 Ignores brackets

*Slips (-1)*

S1 Arithmetic error in calculation (once only) – work shown

S2 Decimal error

*Misreadings (-1)*

M1 Error in copying down a digit (once only)

*Attempts (2 marks)*

A1 Any attempt at addition/subtraction. [Evidence of operation-at least one correct digit]

A2 Special cases: 60, 11, 19 or 53 (with/without work)

*Worthless (0)*

W1 Incorrect answer without work

**(b)(iii)**

**5 marks**

**Att 2**

(iii)	25
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\* Accept correct answer without work

\* Performs the following incorrect operations. (with/without work)

*Blunders (-3)*

B1  $5 \times 2 = 10$

B2  $5 \div 2 = 2.5$

B3  $2^5 = 32$

B4  $2 \div 5 = 0.4$

B5  $\sqrt{5} = 2.236$

B6  $5 - 2 = 3$  or  $5 + 2 = 7$

*Slips (-1)*

S1 Arithmetic error in calculation (once only)

S2 Decimal error

S3  $5 \times 5$  and stops, once only

M1 Error in copying down digit (just once)

*Attempts (2 marks)*

A1  $5 \times 2$ , or any of the above operations (and stops)

*Worthless (0)*

W1 Incorrect answer without work

**b (iv)**

**5 marks**

**Att 2**

9
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\* Accept correct answer without work

\* Performs the following incorrect operations (with/without work)

*Blunders (-3)*

B1  $(81)^{\frac{1}{2}} = 40.5$

B2  $81 \times 2 = 162$

B3  $81^2 = 6561$

*Slips (-1)*

S1 Arithmetic error in calculation

S2 Decimal error

*Misreadings (-1)*

M1 Error in copying down digit

*Attempts (2marks)*

A1  $81^{\frac{1}{2}}$  and stops

A2  $81 \times 2$  or  $81 \div 2$  and stops

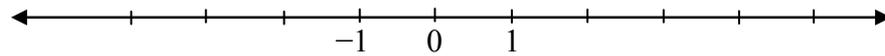
A4 Incorrect use of Mathematical Tables

*Worthless (0)*

W1 Incorrect answer without work

**Part (c)****20 (10,10) marks****Att 6 (3, 3)**

- (i) Write these numbers in order, starting with the smallest:  
0.5, 1, 0.25, 0.6
- (ii) Place the numbers 3, 4, -2 and -3 in their correct positions on the number line below.

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

Answer: 0.25, 0.5, 0.6, 1

\* Accept correct answer without work.

*Blunders (-3)*

B1 Omits a number each time

B2 Number in incorrect order (each time)

*Slips (-1)*

S1 Numbers in decreasing order

*Misreadings (-1)*

M1 Error in copying down digit

*Attempts (3marks)*

A1 Any attempt at ordering [Evidence of operation – at least one correct digit]

A2 Change some or all the numbers to correct fractions

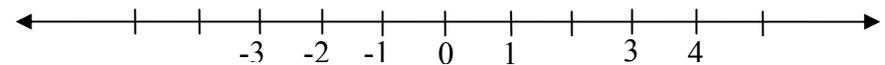
A3 Ignores the decimals and orders correctly

A4 0.25 (only).

*Worthless (0)*

W1 Incorrect answer without work

W2 Copying down numbers as they are

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

\* Accept correct answer without work

*Blunders (-3)*

B1 No labels, or incorrect labelling (once only)

B2 Omits a number (but see A2 below)

B3 Point or points plotted incorrectly (each time), but see A2

*Slips (-1)*

S1 Incorrect signs

*Misreadings (-1)*

M1 Error in copying down digit (once only)

*Attempts (3marks)*

A1 One number plotted correctly

*Worthless (0)*

W1 Incorrect answer without work

## QUESTION 2

<b>Part (a)</b>	<b>10 marks</b>	<b>Att 3</b>
<b>Part (b)</b>	<b>20 (10,10) marks</b>	<b>Att 6 (3,3)</b>
<b>Part (c)</b>	<b>20 marks</b>	<b>Att 7</b>

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

**2. (a)** Find the mode of the following numbers.  
5, 8, 5, 4, 1, 5

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

5

\* Accept answer indicated.

*Blunders (-3)*

B1 Correct frequency table constructed and stops

*Slips (-1)*

S1 Each incorrect or omitted entry in Frequency Table (MAX 3)

*Attempts (3 marks)*

A1 "three" written or 3 or "most common number"

A2 Tries to find mean, with work

A3 Numbers rearranged in ascending/descending order

A4 4.6 given as answer (mean) with/without work

*Misreadings (-1)*

M1 Error in copying down digit

*Worthless (0)*

W1 Incorrect answer without work but see A1 and A4

**Part (b)****20 (10,10) marks****Att 6 (3,3)**

The following table shows the hours of sunshine each day for one week at Dublin Airport.

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Hours	8	2	6	10	5	7	4

i) Calculate the total number of hours of sunshine for the week.

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

$$8 + 2 + 6 + 10 + 5 + 7 + 4 = 42$$

\* Ignore excess work.

*Blunders (-3)*

B1 Correct answer without work

B2 No total

*Slips (-1)*

S1 Each incorrect or omitted entry (MAX 3), Minimum 3 numbers added. Otherwise attempt mark only.

S2 Incorrect total

*Misreadings (-1)*

M1 Error in copying down digit

*Attempts (3 marks)*

A1 Selects more than one of 8, 2, 6, 10, 5, 7, 4

A2 An effort at Bar-Chart or Trend Graph

*Worthless (0)*

W1 Incorrect answer without work

W2 Selects at most one of A1 above

W3 Any other incorrect number

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

Calculate the mean number of hours of sunshine per day.
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**(b)(ii)****10 marks****Att 3**

$42 \div 7 = 6$
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\* Accept candidate's answer above.

*Blunders (-3)*

- B1 Correct answer without work
- B2 Incorrect operator
- B3 Incorrect numerator
- B4 Incorrect denominator or no denominator
- B5 No final step
- B6 Inverted fraction

*Slips (-1)*

- S1 Each incorrect or omitted entry (MAX 3) if candidate starts again
- S2 Arithmetic error

*Attempts (3 marks)*

- A1 Attempts to draw a trend graph, or a bar-chart
- A2 Orders the numbers
- A3 Mentions 42, Candidate's previous answer, or 7
- A4 Answer 294, 49, 35,  $\frac{1}{6}$  without work

*Worthless (0)*

- W1 Incorrect answer without work but see A4

**Part (c)****20 marks****Att 7**

- (c) 40 people were asked what colour of eyes they had.  
The table shows the results.

Colour of eyes	Blue	Green	Hazel	Brown
Number of people	10	10	5	15

Represent this information on a pie chart.

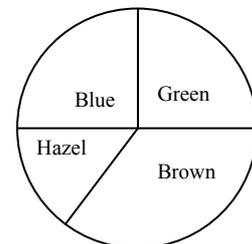
**(c)****20 marks****Att 7**

(Blue)  $\frac{10}{40} \times 360^\circ = 90^\circ$

(Green)  $\frac{10}{40} \times 360^\circ = 90^\circ$

(Hazel)  $\frac{5}{40} \times 360^\circ = 45^\circ$

(Brown)  $\frac{15}{40} \times 360^\circ = 135^\circ$  or  $360^\circ - (90^\circ + 90^\circ + 45^\circ) = 135^\circ$



- \* Angles may not be exact in diagram.
- \* Tolerance  $\pm 5^\circ$
- \* It is only necessary to calculate any two different angles.
- \* Accept candidate's calculated angles in pie chart.
- \* Mark for 3 segments only.
- \* Allow numbers or degrees as labels.

*Blunders (-3)*

- B1 Correct answer with work not shown
- B2 Mathematical error in calculating angle once only
- B3 Each segment not drawn or incorrectly drawn (MAX TWICE).
- B4 No circle, but angles drawn
- B5 Segments not meeting and/or extra segments drawn.
- B6 Outside Tolerance but be careful with 4<sup>th</sup> segment.
- B7 Excess segment or segments

*Slips (-1)*

- S1 Arithmetic error in calculation
- S2 Each label omitted or incorrect, (max. 3)

*Attempts (7 marks)*

- A1 Circle drawn
- A2 Draws bar chart, pictogram etc.
- A3 Mention of 360°, 90° or 180°
- A4 Any work with 90, 45, 135, 15, 10 or 5 and stops
- A5 any use of 40 or 9°

*Worthless (0)*

- W1 Incorrect answer without work but see A4.

**Case: If no calculations/values for angles shown and Pie chart with 4 segments drawn**

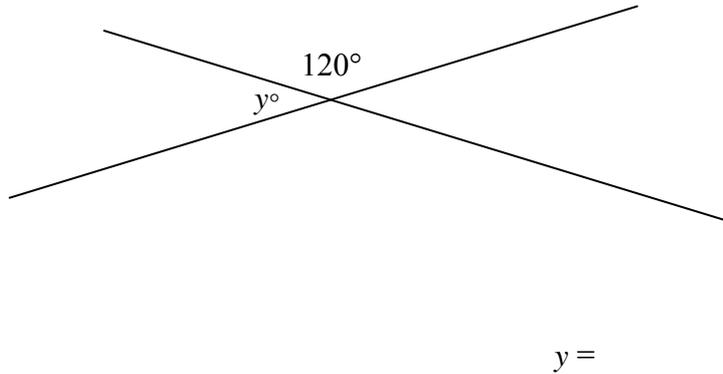
- |  |                             |
|--|-----------------------------|
| ● 4 correct and correctly-labelled segments                  | $1 \times B = 17 \text{ m}$ |
| ● 2 or more of segments incorrect but appropriately labelled | $3 \times B = 11 \text{ m}$ |
| ● 4 correct segments but all unlabelled or mislabelled       | $2 \times B = 14 \text{ m}$ |
| ● No segment correct but labelled                            | $3 \times B = 11 \text{ m}$ |
| ● 2 or more segments incorrect and unlabelled                | $4 \times B = 8 \text{ m}$  |

### QUESTION 3

<b>Part (a)</b>	<b>10 marks</b>	<b>Att 3</b>
<b>Part (b)</b>	<b>20 (5,5,10) marks</b>	<b>Att 7 (2,2,3)</b>
<b>Part (c)</b>	<b>20 (10, 10) marks</b>	<b>Att 6 (3, 3)</b>

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

 Find the value of  $y$  in the diagram below.



**(a)** **10 marks** **Att 3**

**(a)**  $180^\circ - 120^\circ = 60^\circ$

- \* No Penalty for degree symbol ( $^\circ$ ) missing.
- \* Angles marked in diagram correctly is work shown. If answer correct: full marks.

*Blunders (-3)*

- B1 Correct answer without work
- B2 Performs addition ( $180^\circ + 120^\circ = 300^\circ$ )
- B3  $360^\circ - 120^\circ$  or  $90^\circ - 120^\circ$  and continues to get an answer
- B4 Final step missing

*Slips (-1)*

- S1 Arithmetic error in calculation
- S2 Decimal error

*Misreadings (-1)*

- M1 Error in copying down a component/digit

*Attempts (3 marks)*

- A1 Measures angle from diagram. ( $60^\circ$ )  $\pm 5^\circ$ , (55-59) or (61-65), inclusive)
- A2 Any mention of  $180^\circ$ ,  $90^\circ$  or  $360^\circ$
- A3 Shows opposite angles equal. ( $120^\circ$ )

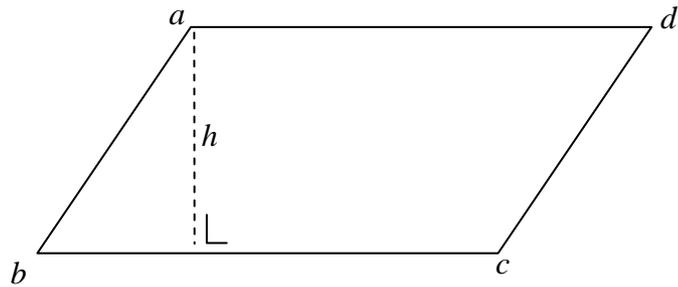
*Worthless (0)*

- W1 Copies diagram & stops
- W2 Uses  $100^\circ$  as straight line angle

Part(b)

20 (5.5,10) marks

Att 7 (2,2,3)



(b)  $abcd$  is a parallelogram.

(i) Using your ruler measure the length of the base  $[bc]$ .

length of  $[bc]$  = \_\_\_\_\_

(ii) Using your ruler measure the perpendicular height  $h$ .

(b)(i)

5 marks

Att 2

length of  $[bc]$  = 6 cm or 2.4 inches

\* Allow 4 cm or 1.6 inches as answer.

5.5-6.5 (inclusive) or 3.5-4.5 (inclusive) or (2.2-2.6 inches) or (1.4-1.8) 5 Marks

5.0-5.4 (inclusive) or 3.0-3.4 (inclusive) or (1.9-2.1 inches) or (1.2-1.3) 2 Marks

6.6-7.0 (inclusive) or 4.6-5.0 (inclusive) or (2.7-2.9 inches) or (1.9-2.1) 2 Marks

Otherwise 0 Marks

(b)(ii)

5 marks

Att 2

$h$  = 3 cm or 1.2 inches.

\* Allow 4 cm or 1.6 inches as answer

2.5-3.5 (inclusive) or 3.5-4.5 (inclusive) or (1.0-1.4) 5 Marks (see inches above)

2.0-2.4 (inclusive) or 3.0-3.4 (inclusive) or (0.8-0.9) 2 Marks

3.5-4.0 (inclusive) or 4.6-5.0 (inclusive) or (1.5-1.6) 2 Marks

Otherwise 0 Marks

**(b)(iii)**

**10 marks**

**Att 3**

b(iii) Calculate the area of the parallelogram.

b(iii) Area = base  $\times$  perpendicular height =  $6 \times 3 = 18$

\* Allow answers from previous section

*Blunders (-3)*

B1 Correct answer without work

B2 Each incorrect or omitted substitution

B3 Mathematical error e.g. wrong operator

B4 Wrong formula used e.g. length  $\times$  breadth (giving  $6 \times 3 \cdot 5 = 21$ ) or  $\frac{1}{2}$  base  $\times$  height

B5 Gets Perimeter instead of area correctly (ans. 19)

*Slips (-1)*

S1 Arithmetic error in calculation

S2 Decimal error

S3 Fails to finish

*Misreadings (-1)*

M1 Error in copying down a digit

*Attempts (3 marks)*

A1 Mentions 6, 3, 3·5 or value from (i) or (ii) or “base” or “height”

*Worthless (0)*

W1 Incorrect formula with  $\pi$ , and stops but see A1

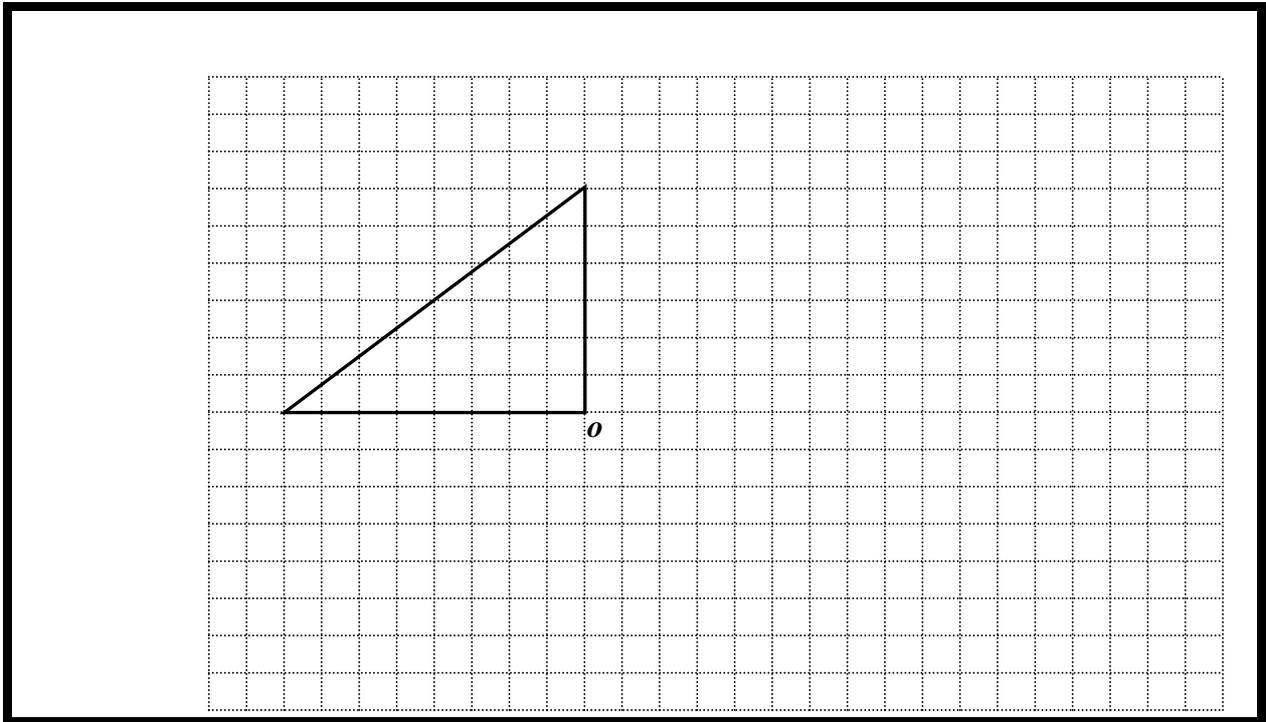
W2 Incorrect answer without work, except 19

Part (c)

20 (10, 10) marks

Att 6 (3, 3)

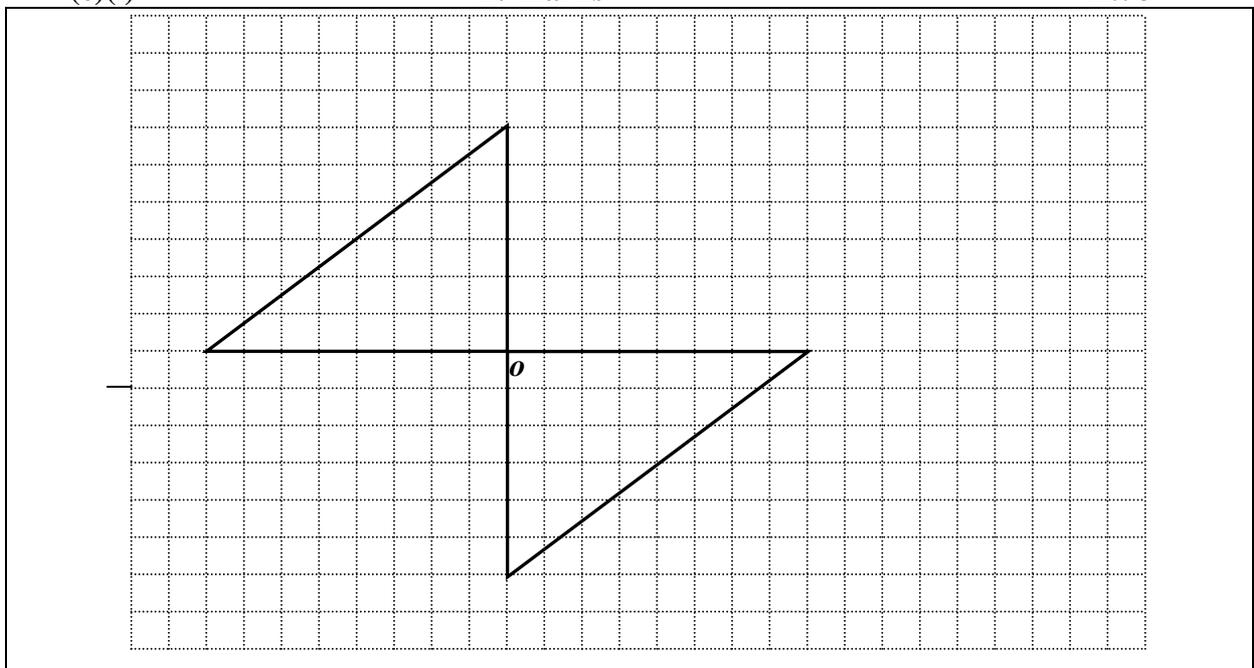
- (i) Draw the image of the triangle in the diagram under the central symmetry in the point  $o$ .



(c)(i)

10 marks

Att 3



\* Tolerance  $\pm 0.5$  cm. (one square) but see B2.

*Blunders (-3)*

- B1 Vertices located but not joined
- B2 *o* not mapped onto *o*, other than when B3 applies
- B3 Central symmetry but centre of symmetry not at *o*
- B4 Wrong transformation
- B5 Each vertex incorrectly mapped.

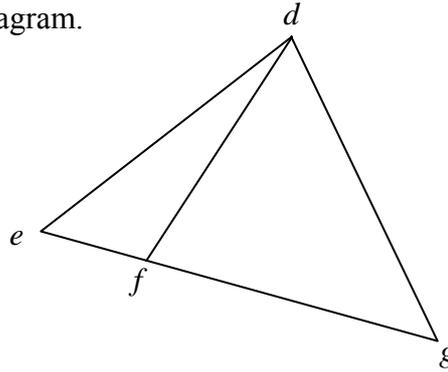
*Attempts (3 marks)*

- A1 Any triangle drawn
- A2 Any effort at locating an image including *o*

(c)(ii) There are 3 different triangles in the diagram.

*def* is one of them.

Name the other two triangles.



(c)(ii)

10 marks

Att 3

*dfg, deg*

\* Allow *defg* or similar.

*Blunders (-3)*

- B1 One answer incorrect or omitted
- B2 *def* (in any order) as one of the two answers

*Slips (-1)*

- S1 Triangle clearly identified but not written (each time)

*Attempts (3 marks)*

- A1 *def* (in any order) and no other triangle named.

## QUESTION 4

<b>Part (a)</b>	<b>10 marks</b>	<b>Att 3</b>
<b>Part (b)</b>	<b>15 (5,10) marks</b>	<b>Att 5 (2,3)</b>
<b>Part (c)</b>	<b>25 (5,15,5) marks</b>	<b>Att 9 (2,5,2)</b>

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

**(a)** Find the value of  $3a + b$  when  $a = 4$  and  $b = 1$

**(a)** **10 marks** **Att 3**

**(a)**  $3(4) + 1 = 12 + 1 = 13$

### *Blunders (-3)*

- B1 Correct answer without work
- B2 Association error e.g.  $3(4+1) = 3(5) = 15$
- B3 Mathematical error e.g.  $[3(4) + 1 = 34 + 1 = 35]$  or  $[3(4) + 1 = 7 + 1 = 8]$
- B4 Not finishing
- B5 Wrong operator and continues. e.g.  $(3 + 4 + 1 = 8)$

### *Slips (-1)*

- S1 Arithmetic error in calculation MAX 3

### *Misreadings (-1)*

- M1 Error in copying down a component
- M2  $3(1) + 4 = 3 + 4 = 7$

### *Attempts (3 marks)*

- A1  $3a + b = 4$  (or similar), and continues
- A2 Any correct step e.g.  $3(4)$  & stops
- A3 Special Cases: 12, 5, 8, 8, 35, 7 (with no work shown)

### *Worthless (0)*

- W1 Incorrect answer without work

**Part (b)**

**15 (5, 10) marks**

**Att 5 (2, 3)**

**(b)** (i) Simplify  $3(x+1) + 2(x-1)$

(ii) Solve for  $x$  :  
 $2x + 3 = 13$

**(b)(i)**

**5 marks**

**Att 2**

**(b) (i)**  $3(x+1) + 2(x-1)$   
 $= 3x + 3 + 2x - 2$   
 $= 3x + 2x + 3 - 2$   
 $= 5x + 1$

*Blunders (-3)*

- B1 Correct answer without work
- B2 Distribution error (once)
- B3 Mathematical error e.g.  $3x + 3$  as  $6x$
- B4 Ignores 3 or 2, and continues

*Slips (-1)*

- S1 Arithmetic errors in calculation (Max 3)
- S2 Fails to finish (only applies to last line) otherwise blunder
- S3 Sign error

*Misreadings (-1)*

- M1 Error in copying down expression (If task is not oversimplified) See B4

*Attempts (2 marks)*

- A2 Any relevant step e.g.  $3x$  and stops or similar

*Worthless (0)*

- W1 Incorrect answer without work
- W2 Particular Case: Substitutes a value for  $x$  into expression

**(b)(ii)**

**10 marks**

**Att 3**

$$\begin{aligned}2x + 3 &= 13 \\2x &= 13 - 3 \\2x &= 10 \\x &= 5\end{aligned}$$

\* Accept successful T/E with work. e.g.  $10 + 3 = 13$ , but 5 must appear.(otherwise a blunder)

*Blunders (-3)*

- B1 Correct answer without work
- B2 Transposition error (each time)
- B3 Mathematical error e.g.  $2x + 3$  as  $5x$
- B4 Ignores 13 & continues. i.e.  $2x + 3 = 0, \Rightarrow x = -1.5$
- B5 Fails to finish e.g.  $2x = 10$  and stops

*Slips (-1)*

- S1 Arithmetic errors in calculation (Max 3)

*Misreadings (-1)*

- M1 Error in copying down equation (If task is not oversimplified)

*Attempts (3 marks)*

- A1 Unsuccessful T/E
- A2 Special Case:  $x = 10$  or 10 (no work)

*Worthless (0)*

- W1 Incorrect answer without work

## Part (c)

25 (5, 15, 5) marks

Att 9 (2, 5,2)

(c) (i) Given that  $y = 3x + 2$ , complete the table below.

$x$	1	2	3	4	5
$y$		8			

(c)(i)

5 marks

Att 2

- (i)  $3(1) + 2 = 5$ ;  
 $[3(2) + 2 = 8]$ ;  
 $3(3) + 2 = 11$ ;  
 $3(4) + 2 = 14$ ;  
 $3(5) + 2 = 17$

$x$	1	2	3	4	5
$y$	5	[8]	11	14	17

- \* Answers need not be written in table
- \* Correct answers without work full marks
- \* **If Graph fully correct**, 5 marks here in (b)(i)

*Blunders (-3)*

- B1 Each entry omitted or incorrect. [Assuming at least one correct entry] unless consistent.  
 B2 Mathematical error e.g.  $y = 3x$  (apply once)  
 B3 Calculation error, once if consistent, i.e.  $y = x+1$  or  $y = x+3$  or  $y = 3(x+1)$ , with/without work.

$y = x+1$	2, 3, 4, 5	$y = x+3$	4, 5, 6, 7	$y = 3(x+1)$	6, 9, 12, 15
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*Slips (-1)*

- S1 Adds in top line of table (watch for consistency) (6, 10, 14, 18, 22 or 6, 8, 14, 18, 22)

- S2 Arithmetic error in calculation (Max 3)

*Misreadings (-1)*

- M1 Error in copying down equation (If task is not oversimplified)

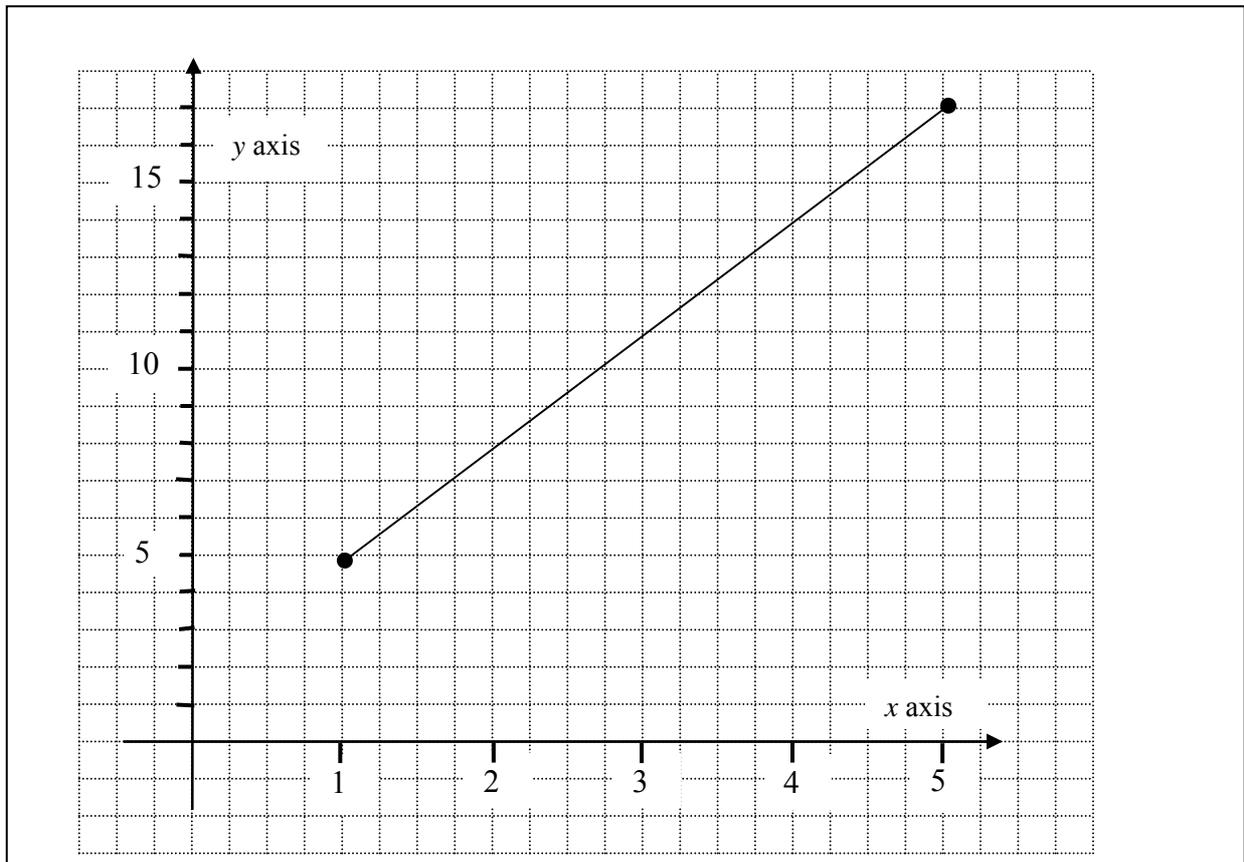
*Attempts (2 marks)*

- A1 Any one correct entry with / without work  
 A2  $x = 2$  (only one worked out), correctly  
 A3 4, 8, 12, 16, 20

*Worthless (0)*

- W1 Table completed with spurious numbers  
 W2 Copies down table, with no additional work  
 W3 31, 32, 33, 34

(ii) Using your answers from (i), draw the graph of  $y = 3x + 2$  from  $x = 1$  to  $x = 5$ .



- \* If only 2,3 or 4 correct points are correctly plotted and no mark was awarded for c(i), award Att 2 in (c)(i).
- \* Tolerance  $\pm 0.5\text{cm}$  ( $\pm 1$  Box on grid)
- \* Permit candidate's work from (c)(i)

*Blunders (-3)*

- B1 Scale error (once)
- B2 Draws histogram or bar chart

*Slips (-1)*

- S1  $(y, x)$  consistently drawn (Penalise once only)
- S2 All points not joined
- S3 Each incorrectly plotted point [subject to S1], or omitted end point

*Attempts (5 marks)*

- A1 Random straight line or lines
- A2 One correct point

**Part(c)(iii)**

**5 marks**

**Att 2**

**(iii)** Use your graph to find the value of  $y$  when  $x = 3.5$ .

**(c)(iii)**

**5 marks**

**Att 2**

12.5

\* Tolerance  $\pm 0.5$ cm (one box)

*Blunders (-3)*

B1 If no indication on graph but correct answer got from subbing into equation.

*Attempts (2 marks)*

A1 Any one entry with / without work

A2 Locates 3.5

A3 Draws any line on graph

## QUESTION 5

<b>Part (a)</b>	<b>10 marks</b>	<b>Att 3</b>
<b>Part (b)</b>	<b>20 (10,5,5) marks</b>	<b>Att 7 (3,2,2)</b>
<b>Part (c)</b>	<b>20 (10,10) marks</b>	<b>Att 6(3,3)</b>

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

**(a)** Change 4.72 kg to grams.

**(a)** **10 marks** **Att 3**

$$4.72 \times 1000 = 4720$$

\* No penalty for missing units.

### *Blunders (-3)*

- B1 1 kg not equal to 1000 grams
- B2 Wrong operator
- B3 Fails to finish

### *Slips (-1)*

- S1 Arithmetic error in calculation
- S2 Decimal error
- S3 Rounds 4.72 to 5 or 4.72 to 4.7 and continues correctly

### *Misreadings (-1)*

- M1 Error in copying down a digit

### *Attempts (2 marks)*

- A1 Any mention of 1000

### *Worthless (0)*

- W1 Incorrect answer without work, other than 47.2, 472, all decimal error

**Part(b)**

**20 (10,5,5) marks**

**Att 7 (3,2,2)**

**(b)** A car travelled at a speed of 80 km/h for 2 hours.

**(i)** Find the distance travelled by the car.



The car then travelled a further 150 km at a speed of 100 km/h.

**(ii)** Find the time taken by the car to travel this 150 km.

**(iii)** What was the total time spent travelling?

**(b)(i)**

**10 marks**

**Att 3**

b(i)

$80 \times 2 = 160 \text{ km.}$

\* No penalty for missing units

\* Candidate may convert to minutes in effort to get answer

*Blunders (-3)*

B1 Correct answer without work

B2 Wrong operator

*Slips (-1)*

S1 Arithmetic error in calculation

S2 Decimal error

*Misreadings (-1)*

M1 Error in copying down a digit

*Attempts (3 marks)*

A1 **D/S/T** in triangle or mentioned

A2 Answer 40, 9600, 82 or 78 (without work)

*Worthless (0)*

W1 Incorrect answer without work

**(b)(ii)**

**5 marks**

**Att 2**

$\frac{150}{100} = 1.5 \text{ hr.}$
-------------------------------------

\* No penalty for missing units

*Blunders (-3)*

B1 Correct answer without work

B2 Incorrect operator

B3 Inverts fraction, (0.6666...)

*Slips (-1)*

S1 Arithmetic error in calculation

S2 Decimal error

S3 Fails to finish

*Misreadings (-1)*

M1 Error in copying down a digit

*Attempts (2 marks)*

A1 Any attempt at division

A2 Answer 150 minutes (no work shown)

A3 **D/S/T** in triangle or mentioned

A4 Special Cases: 50, 250, 1500, 15000, 1.3 (no work shown)

*Worthless (0)*

W1 Incorrect answer without work but see A4

**(b)(iii)**

**5 marks**

**Att 2**

$2 + 1.5 = 3.5$
-----------------

\* Permit candidate's work from above

*Blunders (-3)*

B1 Correct answer without work

B2 Incorrect operator

B3 Adds 80 and 150 or adds 160 and 150

*Slips (-1)*

S1 Arithmetic error in calculation

S2 Decimal error

*Misreadings (-1)*

M1 Error in copying down a digit. e.g.(1.5 hrs = 1 hr, 50 min)

*Attempts (2 marks)*

A1 Any attempt at addition.

A2 Adds distance and time from (i) and (ii)

*Worthless (0)*

W1 Incorrect answer without work

**Part (c)****20 (10,10)marks****Att 6 (3,3)****(c)** A rectangular block measures 30 cm × 18 cm × 16 cm.**(i)** Calculate the volume of the block in cm<sup>3</sup>.**(ii)** A rectangular piece, measuring 15 cm × 7 cm × 8 cm is cut from this block.

Calculate the volume that remains.

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

$$\begin{aligned} \text{Volume} &= 30 \times 18 \times 16 \\ &= 8640 \text{ cm}^3 \end{aligned}$$

\* No penalty for missing units

*Blunders (-3)*

- B1 Correct answer without work
- B2 Each incorrect or omitted substitution
- B3 Incorrect relevant formula, but see S4
- B4 Fails to finish but see S3
- B5 Calculates area of any side and stops
- B6 Surface Area incomplete, but see S4

*Slips (-1)*

- S1 Arithmetic error in calculation, to MAX 3
- S2 Decimal error
- S4 Gives answer as 540 × 16 or 30 × 288
- S4 Calculates surface area correctly (2616)

*Misreadings (-1)*

- M1 Error in copying down a digit

*Attempts (3 marks)*

- A1 Mentions volume = length × breadth × height, and stops
- A2 Shades in area or states “is space inside” or similar
- A3 Correct substitution into incorrect volume formula with  $\pi$

*Worthless (0)*

- W1 Incorrect answer without work
- W2 Incorrect formula with  $\pi$  – but see A3
- W3  $30 \pm 18 \pm 16$  (with or without work)

(c)(ii)

10 marks

Att 3

$15 \times 7 \times 8 = 840 \text{ cm}^3$ $8640 - 840 = 7800 \text{ cm}^3$
--

- \* No penalty for missing units
- \* Allow candidate's answer from (c)(i)

*Blunders (-3)*

- B1 Correct answer without work
- B2 Each incorrect or omitted substitution
- B3 Incorrect relevant formula – but see S4
- B4 Fails to finish (answer 840)
- B5 Calculates area of any side and stops (but B5 may still apply)

*Slips (-1)*

- S1 Arithmetic error in calculation, to MAX 3
- S2 Decimal error
- S3 Gives answer as 8640 - 840 and stops
- S4 Calculates SA correctly (562)

*Misreadings (-1)*

- M1 Error in copying down a digit

*Attempts (3 marks)*

- A1 Mentions volume = length  $\times$  breadth  $\times$  height, and stops
- A2 Shades in area or states “is space inside” or similar
- A3 Any effort to get Surface Area with relevant figures
- A4 Correct substitution into incorrect volume formula with  $\pi$

*Worthless (0)*

- W1 Incorrect answer without work
- W2 Incorrect formula with  $\pi$
- W3  $15 \pm 7 \pm 8$  (with or without work)

## QUESTION 6

<b>Part (a)</b>	<b>10 marks</b>	<b>Att 3</b>
<b>Part (b)</b>	<b>20 (15,5) marks</b>	<b>Att 8 (5,3)</b>
<b>Part (c)</b>	<b>20 (10,5,5) marks</b>	<b>Att 7 (3,2,2)</b>

<b>Part (a)</b>	<b>10 marks</b>	<b>Att 3</b>
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(a) I purchased a cinema ticket for €7.50.

How much change did I get if I paid with a €20 note?

<b>(a)</b>	<b>10 marks</b>	<b>Att 3</b>
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$$€20 - €7.50 = €12.50$$

\* No penalty for omission of €symbol.

\* Allow answer in cents (1250) with work otherwise B3.

*Blunders (-3)*

B1 Uses any operation other than subtraction

B2 Fails to finish

B3 Correct answer without work

*Slips (-1)*

S1 Arithmetic error in calculation

S2 Decimal error

*Misreadings (-1)*

M1 Error in copying down a component

*Attempts (3 marks)*

A1 Mention of 20 or 7.5

A2 Special Cases: 27.5, 150, 2.66 or  $2\frac{2}{3}$ , 0.375 or  $\frac{3}{8}$  (with no work)

*Worthless (0)*

W1 Any other incorrect answer without work

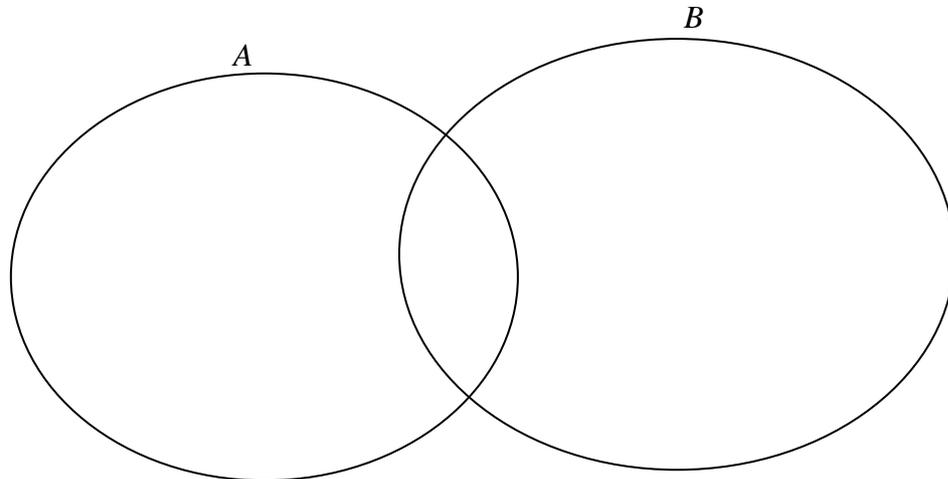
Part (b)

20 (15, 5) marks

Att 7 (5, 2)

(i)  $A = \{1, 2, 3, 5, 6\}$  and  $B = \{2, 3, 4, 6\}$

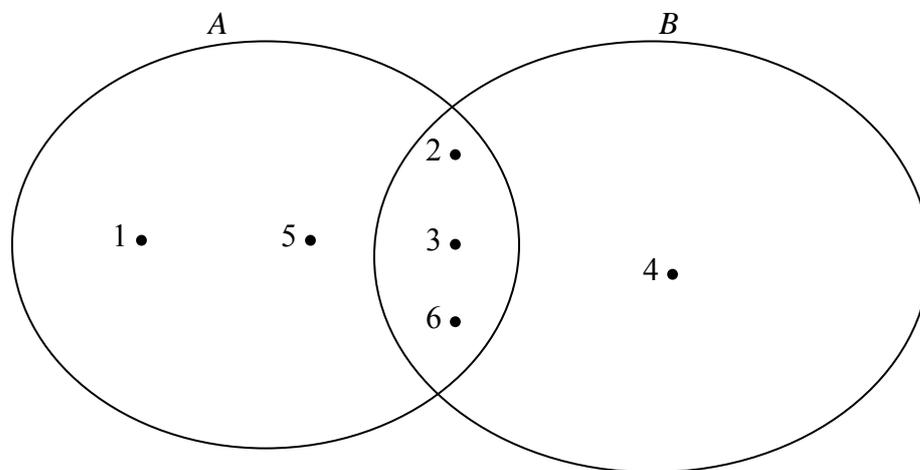
Show the elements of the sets  $A$  and  $B$  on the Venn diagram below.



(b)(i)

15 marks

Att 5



*Slips (-1)*

S1 Each additional or incorrect element or omitted element or misplaced element.

*Attempts (5 marks)*

A1 No elements in  $A \cup B$  – but see W3

*Worthless (0)*

W1 Use of numbers other than those in  $A$  and/or  $B$

W2 Adds numbers

W3 No relevant elements entered anywhere in diagram

(ii)  $P = \{a,b,n\}$   
 $\{a,b\}$  is a subset of P

Write down 2 other subsets.

**Part (b)(ii)**

**5 marks**

**Att 2**

Any two of:

$\{a,n\}$  ,  $\{b,n\}$   $\{a\}$ ,  $\{b\}$ ,  $\{n\}$   $\{a,b,n\}$ ,  $\{ \}$

\* No penalty for omission of brackets.

*Blunders (-3)*

B1 Only one valid subset given

*Attempts (2 marks)*

A1 Gives  $\{a,b\}$  or  $\{b,a\}$  as only answer

A2 Answer 0 (only)

*Worthless (0)*

W1 Any letter not in  $P$

A unit of electricity costs 14 cent.

- (i) Find the cost, in euro, of 400 units of electricity
- (ii) A standing charge of €12 is added.  
What is the electricity bill when this charge is added?
- (iii) What is the total electricity bill when VAT at 13·5% is added?

(c)(i)

10 marks

Att 3

$$400 \times 14 = 5600$$

$$= €56$$

\* No penalty for omission of €symbol

*Blunders (-3)*

B1 Correct answer without work

B2 Uses any operation other than multiplication

*Slips (-1)*

S1 Arithmetic error in calculation

S2 Decimal error

*Misreadings (-1)*

M1 Error in copying down a component

M2 Answer in cents only

*Attempts (3 marks)*

A1 Mention of 400, 14 or 100

A2 Special Cases; 28·57, 386, 414, 0·035 (without work)

*Worthless (0)*

W1 Any other incorrect answer without work – but see A2

(c)(ii)

5 marks

Att 2

$$56 + 12 = 68$$

\* Allow Candidate's answer from above – but see M1

\* No penalty for omission of €symbol

*Blunders (-3)*

B1 Correct answer without work

B2 Uses any operation other than addition

B3 Fails to finish.

*Slips (-1)*

S1 Arithmetic error in calculation

S2 Decimal error

S3 Misuse of units

*Misreadings (-1)*

M1 Error in copying down a component

*Attempts (2 marks)*

A1 Mention of 56, 12 or 14

A2 Special Cases: 44, 4·66, 0·214,  $\frac{3}{14}$ , 672

*Worthless (0)*

W1 Any other incorrect answer without work

**(c)(iii)**

**5 marks**

**Att 2**

$$68 \times \frac{13.5}{100} = 9.18$$

or

$$68 \times 1.135 = 77.18$$

$$68 + 9.18 = 77.18$$

- \* Accept candidate's answer from previous part
- \* Multiplies by 13.5% = showing work

*Blunders (-3)*

- B1 Correct answer without work
- B2 Inverted fraction
- B3 No mention of 100 (Method I)
- B4 Incorrect numerator or denominator
- B5 Incorrect operator

*Slips (-1)*

- S1 Arithmetic error in calculation
- S2 Decimal error
- S3 Fails to finish

*Misreadings (-1)*

- M1 Error in copying down a component/digit

*Attempts (2 marks)*

- A1 Any relevant step e.g. mentions 100 or 13.5 & stops
- A2 Answer from (c)(ii)  $\times 13.5$  (Written down with no work shown)
- A3 Special Cases: 6369.62, any variation of 918 or 7718 (without work)

*Worthless (0)*

- W1 Any other incorrect answer without work. But check by dividing by 13.5 or 1.135