

# MARKING SCHEME

## JUNIOR CERTIFICATE EXAMINATION 2005

### 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.
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 marks</b>	<b>Att 4</b>
<b>Part (b)</b>	<b>20 marks</b>	<b>Att 8</b>
<b>Part (c)</b>	<b>20 marks</b>	<b>Att 7</b>
<b>Part (a)</b>	<b>10(5,5) marks</b>	<b>Att (2,2)</b>

	(i) $89 + 11 =$	
	(ii) $127 \times 5 =$	

<b>(a)</b>	<b>5 marks</b>	<b>Att 2</b>
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(i)	100	
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\* Accept correct answer without work.

*Blunders (-3)*

B1 Uses incorrect operator. (with work)

*Slips (-1)*

S1 Arithmetic error in calculation (once only)

S2 Decimal error.

*Misreadings (-1)*

M1 Error in copying down a digit. (once only)

*Attempts (2 marks)*

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

A2 Special Cases: 78(-), 8.09( $\div$ ), 979(x). 0.123( $\div$  reversed), (without work)

*Worthless (0)*

W1 Incorrect answer without work.

<b>(a)</b>	<b>5 marks</b>	<b>Att 2</b>
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(ii)	635	
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\* Accept correct answer without work.

*Blunders (-3)*

B1 Uses incorrect operator. ( with work)

*Slips (-1)*

S1 Arithmetic error in calculation (once only)

S2 Decimal error.

*Misreadings (-1)*

M1 Error in copying down a digit. (once only)

*Attempts (2 marks)*

A1 Any attempt at multiplication. [Evidence of operation- at least one correct digit]

A2 Special Cases: 132(+), 122 (-), 25.4( $\div$ ). 0.04( $\div$  reversed). (without work).

*Worthless (0)*

W1 Incorrect answer without work.

**Part(b)**

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

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

(i)  $432 + 225 - 234 =$

(ii)  $1242 \div 6 =$

(iii)  $(4 \cdot 2)^2 =$

(iv)  $\sqrt{12 \cdot 25} =$

**b(i)**

**5marks**

**Att 2**

(i)	423
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\* Accept correct answer without work.

*Blunders (-3)*

B1 Uses incorrect operator. (with work)

B2 Performs just one operation.

*Slips (-1)*

S1 Arithmetic error in calculation.

S2 Decimal error.

*Misreadings (-1)*

M1 Error in copying down digit

*Attempts (2 marks)*

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

*Worthless (0)*

W1 Incorrect answer with no work.

**b(ii)**

**5marks**

**Att 2**

(ii)	207
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\* Accept correct answer without work.

*Blunders (-3)*

B1 Uses incorrect operator (with work).

*Slips (-1)*

S1 Arithmetic error in calculation. (once only).

S2 Decimal error.

*Misreadings (-1)*

M1 Error in copying down digit.

*Attempts (2 marks)*

A1 Any attempt at division. (Evidence of operation- at least one correct digit)

A2 Special Cases:  $0.00483 \dots (6 \div 1242)$ . with/without work.

*Worthless (0)*

W1 Incorrect answer with no work, subject to A2.

**b(iii)**

**5marks**

**Att 2**

(iii)

17.64

\* Accept correct answer without work.

*Blunders (-3)*

B1  $4.2 \times 2 = 8.4$ .

B2  $\sqrt{4.2} = 2.049$ .

B3  $2^{4.2} = 18.379$ .

B4  $4.2 \div 2 = 2.1$ .

*Slips (-1)*

S1 Arithmetic error in calculation. (once only)

S2 Decimal error.

S3  $4.2 \times 4.2$  and stops.

*Misreadings (-1)*

M1 Error in copying down digit.

*Attempts (2 marks)*

A1  $4.2 \times 2$  and stops.

A2 Special Cases: (8.4), (2.049), (18.379), (2.1). (without work.)

*Worthless (0)*

W1 Incorrect answer without work.

**b(iv)**

**5marks**

**Att 2**

(iv)

3.5

\* Accept correct answer without work. (Maths Tables, Calculator)

*Blunders (-3)*

B1  $(12.25)^2 = 150.0625$ . (with work)

B2  $12.25 \times 2 = 24.5$  or  $12.25 \div 2 = 6.125$ .

*Slips (-1)*

S1 Arithmetic error in calculation.

S2 Decimal error.

*Misreadings (-1)*

M1 Error in copying down digit.

*Attempts (2 marks)*

A1  $(12.25)^{\frac{1}{2}}$  and stops

A2  $12.25 \times 2$  or  $12.25 \div 2$  & stops.

A3 Special Cases: (150.0625), (24.5), (6.125) without work.

A4 Incorrect use of Mathematical Tables (1.120).


*Worthless (0)*

W1 Incorrect answer without work.

**Part (c)****20 (15,5) marks****Att (5,2)****(i)** Find the total cost of

2 Chocolate Bars @ €1.20 each  
 3 Apples @ €0.45 each  
 2 Soft Drinks @ €1.10 each

**(ii)** I pay with a €20 note. How much change do I get?**(c)(i)****15 marks****Att 5**

(6mks)	Chocolate Bars:	$€1.20 \times 2$	=	2.40
 (9mks)	Apples:	$€0.45 \times 3$	=	1.35
(12mks)	Soft Drinks:	$€1.10 \times 2$	=	2.20
(15mks)				Total
			=	5.95

\* No penalty for omission of € symbol.

\* Accept answer in cents.

*Blunders (-3)*

B1 Correct answer without work (5.95, or 595).

B2 Ignores multiples of items shown. (once only).

B3 Each item omitted from total

B4 Fails to add subtotals.

B5 Incorrect operator with work.

*Slips (-1)*

S1 Arithmetic error in calculation.

S2 Decimal error.

*Misreadings (-1)*

M1 Error in copying component/ digit.

*Attempts (5 marks)*

A1 Any attempt at multiplication/addition. (Evidence of operation- at least one correct digit)

## Worthless (0).

W1 Incorrect answer with no work.

W2 €59.5.

(c)(ii)

5 marks

Att 2



(ii)

$$20 - 5.95 = 14.05$$

- \* Accept candidate's answer from (i).
- \* No penalty for omission of € symbol.
- \* Accept answer in cents.

*Blunders (-3)*

- B1 Correct answer without work
- B2 Adds instead of subtracts.
- B3 Order of subtraction reversed.

Case1: $5.95 - 20 = 14.05$ (No Penalty) Case 2: $5.95 - 20 = 5.75$ (Blunder + Slip i.e. Att 2)
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*Slips (-1)*

- S1 Arithmetic error in calculation.
- S2 Misplaced decimal.

*Misreadings (-1)*

- M1 Error in copying digits.

*Attempts (2 marks)*

- A1 Answer (i) written in this part.
- A2 5.95 / 595 written or used in this part. (Award att 5 to part (i) if **no marks** awarded previously)

*Worthless (0)*

- W1 Incorrect answer without work.

## QUESTION 2

<b>Part (a)</b>	<b>10 marks</b>	<b>Att 4</b>
<b>Part (b)</b>	<b>20 marks</b>	<b>Att 6</b>
<b>Part (c)</b>	<b>20 marks</b>	<b>Att 6</b>

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

(i)  $B = \{ \quad , \quad , \quad \}$

(ii)  $A \cup B = \{ \quad , \quad , \quad , \quad \}$

**(a)(i)(ii)** **10(5,5) marks** **Att (2,2)**

(i) {3,6,9} (ii) {3,4,6,9}

\* Accept appropriate shading.

*Blunders (-3)*

B1 Shades Set A (i)

B2 Shades Intersection (ii)

*Slips (-1)*

S1 Each incorrect or missing element. (Max -3). Assuming at least **one correct** entry.

*Misreadings (-1)*

M1 Error in copying down a component/digit

*Worthless (0)*

W1 No correct element.

**Part (b)**

**20(10,10) marks**

**Att (3,3)**

(i) Write  $\frac{1}{4}$  as a percentage.

(ii) Without using a calculator, write  $\frac{3}{8} - \frac{1}{4}$  as a single fraction.

**(b)(i)**

**10 marks**

**Att 3**

(i) **I**  $\frac{1}{4} \times 100 = 25$       **II**  $\frac{25}{100} = 25$

\* % not required.

\* Accept correct answer without work.

*Blunders (-3)*

B1 Incorrect numerator.

B2 Incorrect denominator.

B3 Divides by 100.

B4 Fails to finish.

*Slips (-1)*

S1 Arithmetic error in calculation.

S2 Decimal error.

*Attempts (2 marks)*

A1 Any use of 100.

A2  $\frac{1}{4} = 0.25$  without work

*Worthless (0)*


W1 Incorrect answer without work.



**(b)(ii)**

**10 marks**

**Att 3**

 (ii)  $\frac{3}{8} - \frac{1}{4} = \frac{3}{8} - \frac{2}{8} = \frac{1}{8}$  or equivalent.

\* Accept any equivalent fraction.

*Blunders (-3)*

- B1 Correct answer without work.
- B2 Incorrect denominator.
- B3 Incorrect numerator.
- B4 Incorrect operation.
- B5 Inverts and continues. (once)
- B6 Answer as decimal.

*Slips (-1)*

- S1 Arithmetic error in calculation.
- S2  $\frac{3}{8} - \frac{2}{8}$  and stops.

*Misreadings (-1)*

- M1 Error in copying down a digit.

*Attempts (3 marks)*

- A1 Any correct decimal or % equivalent & stops.

*Worthless (0)*

- W1 Incorrect answer without work.

Part (c)

20(10,10) marks

Att (3,3)

I invest €625 in a bank for two years at 4% per annum compound interest.



(i) Calculate the interest earned at the end of the first year.



(ii) Calculate the total interest earned at the end of the two years.

(c)(i)

10 marks

Att 3



(i) I:  $\frac{625}{100} = 625 \times \frac{4}{100} = \frac{2500}{100} = 25.$

II:  $625 \times 1.04 = 650 \Rightarrow 650 - 625 = 25$

\* No penalty for omission of € symbol.

*Blunders (-3)*

B1 Correct answer without work.

B2 Inverts. (once) e.g.  $(625 \times 100/4)$

B3  $4\% \neq 0.04$ .

B4 Fails to finish.

B5 Does not subtract 625 (2<sup>nd</sup> method).

B6 Incorrect substitution e.g.  $(625 \times 0.02)$ .

B7 No use of 100.

*Slips (-1)*

S1 Arithmetic error in calculation.

*Misreadings (-1)*

M1 Error in copying down a component/digit.

*Attempts (3 marks)*

A1  $I = \frac{P \times R \times T}{100}$  or identifies any of P, R, T correctly. e.g. 625, 4, 1, or 2.

A2 Any relevant step e.g. mentions 100 & stops.

A3 Any mention of 0.04 or  $\frac{4}{100}$

*Worthless (0)*

W1  $625 \pm 4$

**(c)(ii)**

**10 marks**

**Att 3**



(ii) **I:**  $625 + 25 = 650 \times \frac{4}{100} = 26 = 25 + 26 = 51$

**II:**  $4\% \Rightarrow 1.04 \quad 625 \times 1.04 = 650 \rightarrow [650 \times 1.04 = (676)] \rightarrow 676 - 625 = 51$

\* Accept candidate's answers from part (i).

\* No penalty for omission of € symbol.

*Blunders (-3)*

- B1 Correct answer without work.
- B2 Treats as Simple Interest for each year.
- B3 Incorrect or omitted substitution. (Principal for year 2.)
- B4 Inverts. (once).
- B5 Incorrect use of 4
- B6 Fails to add interest from year 1 to interest from year 2.
- B7 Adds to Principal.
- B8 Does not use amount for year 2.
- B9 No use of 100.

*Slips (-1)*

- S1 Arithmetic error in calculation.
- S2 Misplaced decimal.

*Misreadings (-1)*

- M1 Error in copying down a component/digit.

*Attempts (3 marks)*

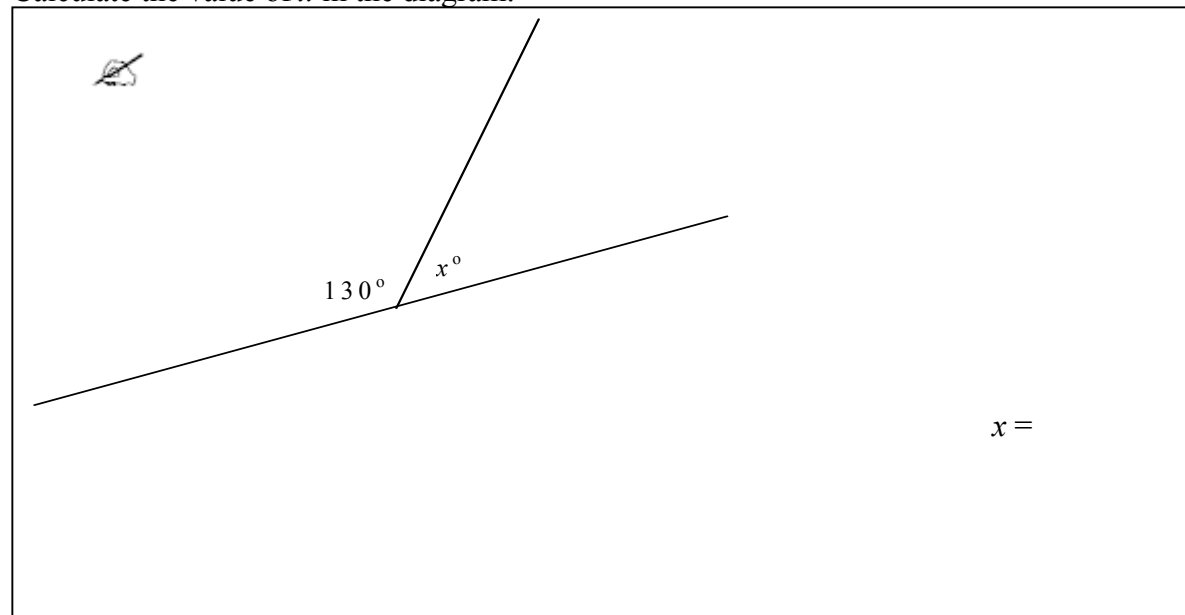
- A1 Some effort at % calculation.
- A2 Multiplies answer (i) by 2. Applies without work.
- A3 Any relevant step.

### QUESTION 3

Part (a)	10 marks	Att 3
Part (b)	20 marks	Att 6
Part (c)	20 marks	Att 6

Part (a) 10 marks Att 3

Calculate the value of  $x$  in the diagram.



(a) 10 marks Att 3



(a)  $130 + x \rightarrow 130 + x = 180 \rightarrow x = 180 - 130 \rightarrow x = 50.$

\* No Penalty for degree symbol ( $^{\circ}$ ) missing.

*Blunders (-3)*

- B1 Correct answer without work.
- B2 Incorrect Operator ( $180 + 130 = 310$ ).
- B3  $360 - 130$  or  $90 - 130$  and continues.

*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. ( $50^{\circ}$ )  $\pm 5^{\circ}$  [Excluding 50]
- A2 Any mention of  $180^{\circ}$ .

*Worthless (0)*

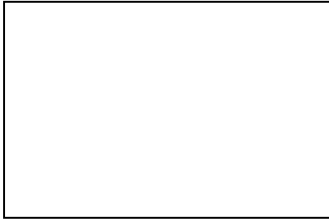
- W1 Copies diagram & stops.
- W2 Uses  $100^{\circ}$  as straight line angle.

Part (b)

20 marks

Att 6

Construct the image of the rectangle under the axial symmetry in the line L.

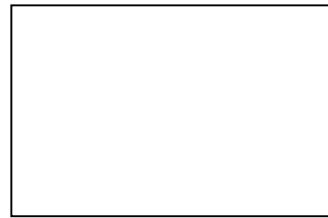
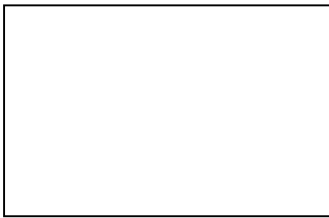


L

(b)

20 marks

Att 6



L

**Correct Vertices not joined merits 17mks.  
Three correct image points merits 14 mks.  
Two correct image points merits 11mks.  
One correct image point merits attempt  
mark.**

\* Tolerance  $\pm 0.5$ cm to the eye.

*Blunders (-3)*

- B1 Vertices located but not joined.
- B2 Incorrect transformation.
- B3 Incorrect or omitted vertex.

*Attempts (6 marks).*

- A1 Copies diagram given. (Onto extra sheet)
- A2 Any rectangle drawn. (Completely out of scale)
- A3 Any effort at locating an image point.

*Worthless (0)*

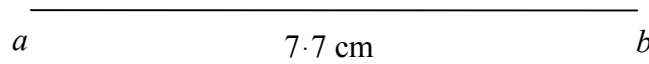
- W1 Random triangle drawn.

Part (c)

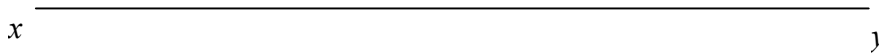
20(15,5) marks

Att (5,2)

- (i) Construct a triangle  $abc$  with  $|ab| = 7.7\text{cm}$ ,  $|ac| = 6\text{cm}$  and  $|bc| = 4.5\text{cm}$



- (ii) Divide the line segment  $[xy]$  into three equal parts. Show all construction lines.



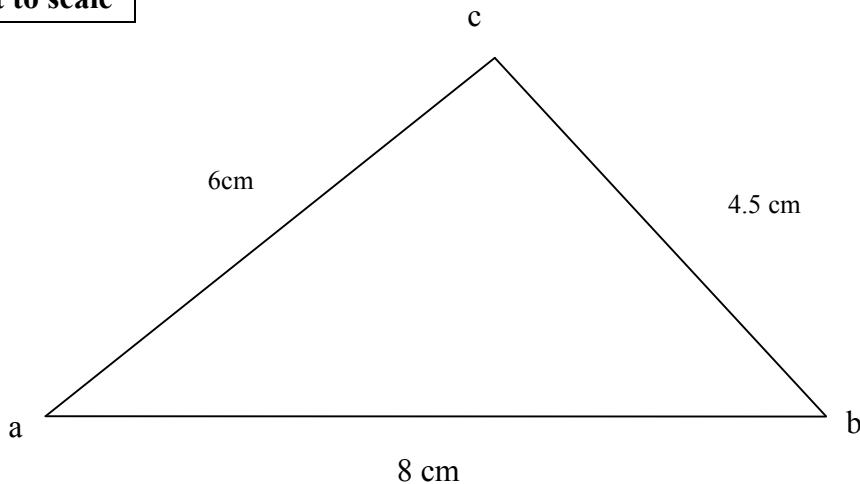
(c)(i)

15 Marks

Att 5

(i)

Not to scale



\*Tolerance  $\pm 0.5\text{cm}$ .

*Blunders (-3)*

B1 Each side omitted or incorrect.

B2 Vertices not joined.

*Slips (-1)*

S1 Uses inches (once only).

*Misreadings (-1)*

M1  $|bc| = 6$ ,  $|ac| = 4.5$ .

*Attempts (5 marks)*

A1 Pilot Diagram.

A2 Draws one or more disjoint lines.

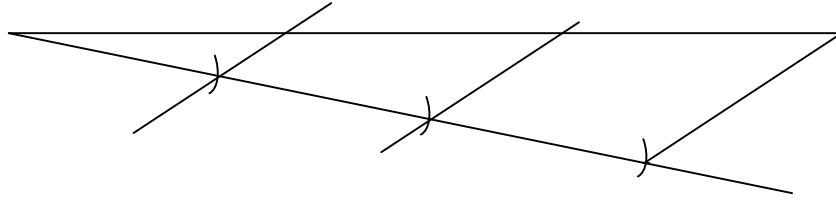
A3 Any reasonable addition to given line.

(c)(ii)

5 marks

Att 2

(ii)



\* Tolerance  $\pm 0.5\text{cm}$ .

*Blunders (-3)*

- B1 Unequal subdivisions of construction line. (once)
- B2 Projections onto line not parallel.
- B3 Subdivisions outside tolerance using construction technique..

*Attempts (2marks)*

- A1 Any relevant step.
- A2 Divides given line in three equal parts using measurement.

*Worthless (0)*

- W1 Bisects line segment.

## QUESTION 4

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

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



Find the mean of the following numbers

16, 12, 14, 15, 8.

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

$$\frac{16+12+14+15+8}{5} = \frac{65}{5} = 13$$

### *Blunders (-3)*

- B1 Correct answer without work.
- B2 Omits 5.
- B3 Addition not complete

### *Slips (-1)*

- S1 Arithmetic error in calculation.
- S2 Each incorrect, omitted or additional number (Max 3).
- S3 Count of numbers not equal to 5.

### *Misreadings (-1)*

- M1 Error in copying down a digit.

### *Attempts (3 marks)*

- A1 Finds median.
- A2 Numbers arranged in ascending or descending order.
- A3 Mention of 5 or 65 with/without work.

### *Worthless (0)*

- W1 Incorrect operator.
- W2 Incorrect answer without work.



**Part (b)**

**20(15,5) marks**

**Att (5,2)**

(b) The following table shows the temperature in a town in Ireland over a four-day period.

Day	Friday	Saturday	Sunday	Monday
Temperature	11	9	12	13

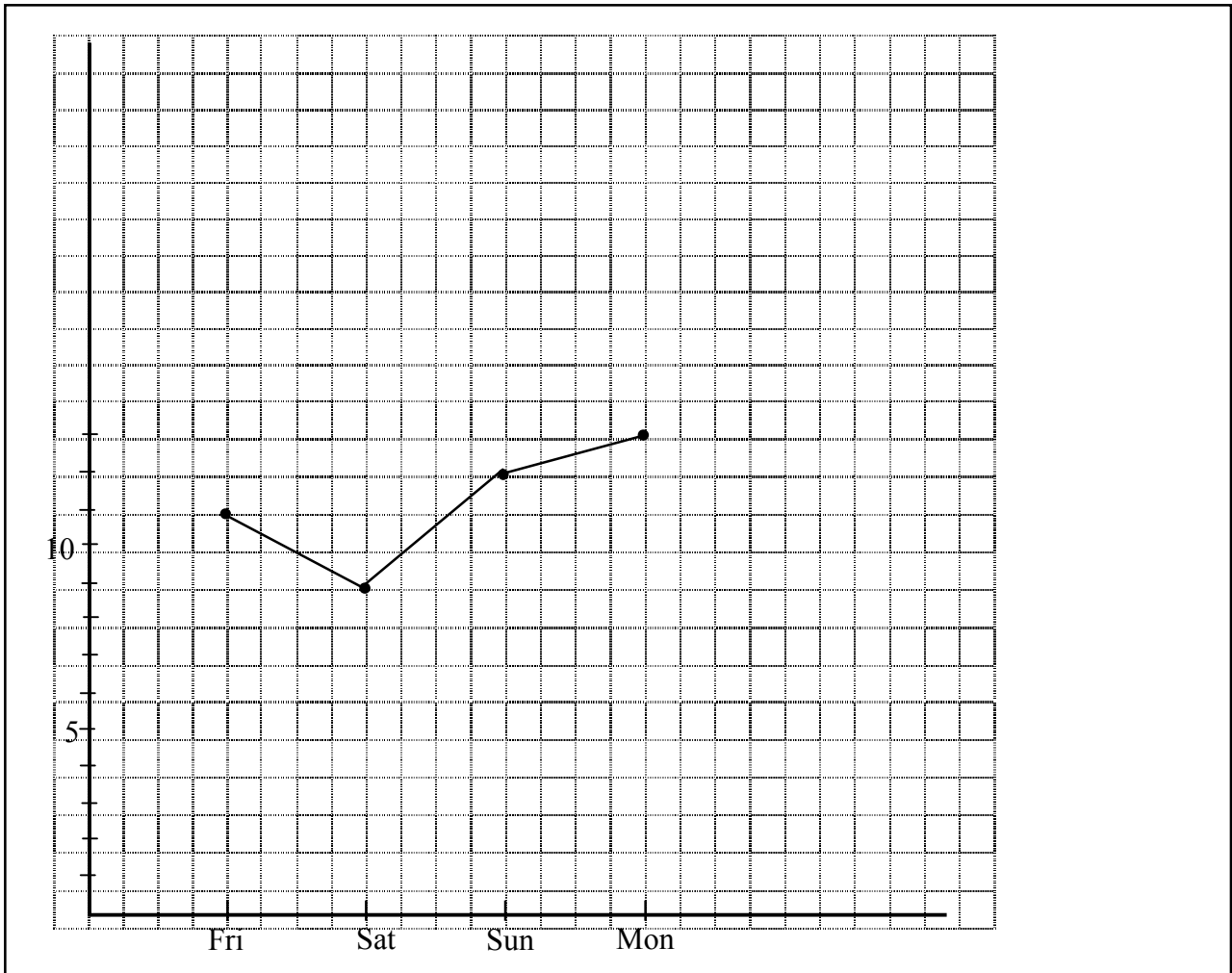


- (i) Draw a trend graph to represent this information.  
Use the grid to draw your trend graph.
  
- (ii) What is the difference between the highest temperature and the lowest temperature?

**(b)(i)**

**15 marks**

**Att 5**



\* Tolerance  $\pm 0.5$  cm , OR  $\pm 1$  box on grid.

*Blunders (-3)*

- B1 Scale error axes. (once)
- B2 Each incorrect or omitted point.
- B3 Draws a histogram or bar chart. (May join centre points to gain full marks).
- B4 Order of data points changed. (once).

*Slips (-1)*

- S1 Points not joined or joined incorrectly.

*Attempts (5 marks)*

- A1 Draws a pie chart.
- A2 Any relevant step.

<b>(b)(ii)</b>	<b>5 marks</b>	<b>Att 2</b>
(ii)	4	

*Blunders (-3)*

- B1 Uses first and last data (  $13 - 11 = 2$  )
- B2 Neither 13 nor 9 used.

*Slips (-1)*

- S1 Arithmetic error in calculation.
- S2 Calculation not complete.  $13 - 9$ .

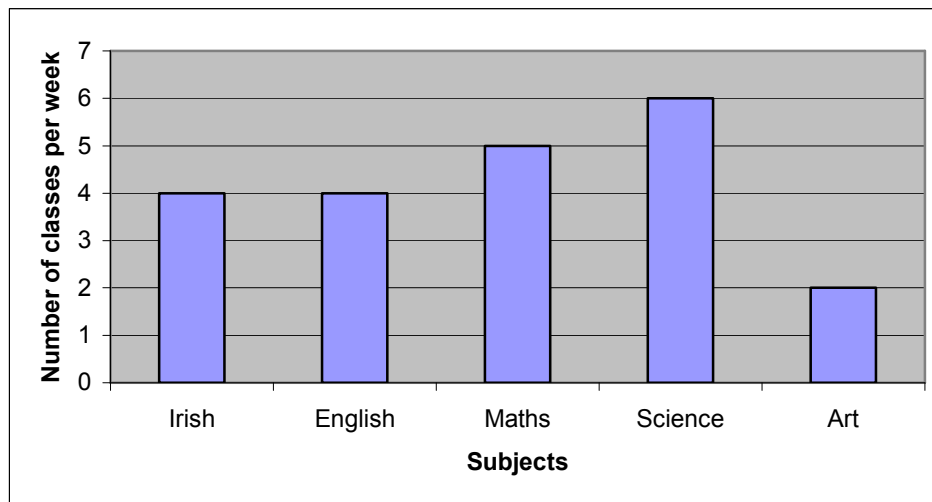
*Attempts (2 marks)*

- A1 13 or 9 written.
- A2 Monday or Saturday written.

*Worthless (0)*

- W1 Incorrect answer without work.

(c) The number of classes per week for five subjects in a school is shown in the bar chart below.



- (i) Which subjects have exactly 4 classes per week?
- (ii) Find the total number of classes per week given to the five subjects
- (iii) Each class is 40 minutes long.  
Find the total time per week given to Irish and Art.

(c)(i)

5 marks

Att 2

(i)	Irish, English.
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\* Accept indication on chart.

*Blunders (-3)*

B1 Chooses one or more incorrect subjects. (once). Assuming at least **one correct** entry.

*Slips (-1)*

S1 Omits one correct subject.

*Attempts (2 marks)*

A1 Selects all subjects .

(c)(ii)

10 marks

Att 3



(ii)

$$4 + 4 + 5 + 6 + 2 = 21$$

*Blunders (-3)*

- B1 Correct answer without work.
- B2 Addition not complete.
- B3 Multiplies values.

*Slips (-1)*

- S1 Arithmetic error in calculation.
- S2 Each incorrect, omitted or additional value. (Max 3). Assuming at least **one correct** entry.

*Attempts (3 marks)*

- A1 Identifies any of the relevant numbers.

*Worthless (0)*

- W1 Incorrect answer with no work.

(c)(iii)

5 marks

Att 2



(iii)

$$4 + 2 = 6 \quad \rightarrow \quad 6 \times 40 = 240 \text{ min or } 4 \text{ hours}$$

*Blunders (-3).*

- B1 Correct answer without work.
- B2 Fails to indicate multiplication by 40.
- B3 Divides by 40.
- B4 Incorrect or omitted subjects. Assuming at least **one correct** entry.
- B5 1hr = 100min.

*Slips (-1)*

- S1 Arithmetic error in calculation.
- S2 Works with candidate's answer from part (ii).
- S3 Decimal error.

*Attempts (2 marks)*

- A1 Multiplication by 40 indicated.
- A2 Any mention of 6, 4, 2, 160 or 80.

*Worthless (0)*

- W1 Incorrect answer with no work.

## QUESTION 5

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

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

- (a) A film starts at 19:45 and lasts 1 hour 55 minutes.  
At what time does the film finish?

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



(a)

$$19:45 + 1:55 = 21:40$$

\* Accept 21:40 as 9:40 or twenty to ten.

### *Blunders (-3)*

- B1 Correct answer without work.
- B2 1 hour = 100 minutes.
- B3 Subtracts (17.50).
- B4 Fails to add.

### *Slips (-1)*

- S1 Arithmetic error in calculation.

### *Misreadings (-1)*

- M1 Error in copying down a digit.

### *Attempts (3 marks)*

- A1 1 hour = 60min.
- A2 19:45 as quarter to eight or similar.

### *Worthless (0)*

- W1 Incorrect answer without work.
- W2 Multiplication / division.

Part (b)

20(10,10) marks

Att (3,3)

A bus travels 210 km in 3 hours.

- (i) Calculate the average speed of the bus in km/h.
- (ii) Another bus travels the 210 km at an average speed of 60 km/h. How long does this bus take to complete the 210 km?



(b)(i)

10 marks

Att 3

 (b) (i)  $S = \frac{D}{T}$        $S = \frac{210}{3} = 70$

\* No penalty for missing units.

*Blunders (-3)*

B1 Correct answer without work.

B2 Error in T,D,S, e.g.  $\frac{3}{210}$  (0.01428) or  $210 \times 3 = 630$ .(once). (with work).

B3 Use of additional incorrect component.

*Slips (-1)*

S1 Arithmetic error in calculation.

S2 Decimal error.

*Misreadings (-1)*

M1 Error in copying down a digit.

*Attempts (3 marks)*

A1 Any mention of T,D,S.

A2 Km  $\rightarrow$  m, or hr  $\rightarrow$  min.

A3 Special Cases: 0.01428..... or 630. (without work).

*Worthless (0)*

W1  $210 \pm 3$ .

W2 Incorrect answer without work.

(b)(ii)

10 marks

Att 3



(ii) I  $T = \frac{D}{S}$        $T = \frac{210}{60} = 3.5$  or 3h 30min

II  $70 - 60 = 10\text{Km/hr (slower)} \rightarrow 10 \times 3 = 30 \text{ Km over 3hrs} \rightarrow \frac{30}{60} = \frac{1}{2} \text{ hr} \rightarrow 3\frac{1}{2}\text{hrs.}$

\* No Penalty for missing units.

*Blunders (-3)*

B1 Correct answer without work.

B2 Error in T,D,S, e.g.  $\frac{60}{210}$  (0.2857) or  $210 \times 60 = 12600$ .(once) (with work).

B3 1hr = 100min.

*Slips (-1)*

S1 Arithmetic error in calculation.

S2 Decimal error.

*Misreadings (-1)*

M1 Error in copying down a digit.

*Attempts (3 marks)*

A1 A1 Any mention of T,D,S.

A2 Km  $\rightarrow$  m, or hr  $\rightarrow$  min.

A3 70 - 60 & stops.

A4 Special Cases: 0.2857 ..... or 12600. without work.

*Worthless (0)*

W1 210  $\pm$ 60.

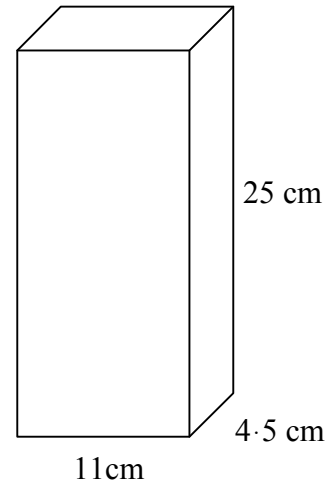
W2 Incorrect answer without work.

Part (c)

20 (10,10)marks

Att (3,3)

- (i) A disc has a radius of 7 cm.  
Find the area of the disc, taking  $\pi = 3.142$ .
- (ii) A rectangular block measures 11 cm  $\times$  4.5 cm  $\times$  25 cm.  
Calculate the volume of the block.



(c)(i)

10 marks

Att 3



$$(c)(i) \quad A = \pi r^2 = \pi 7^2 = 3.142 \times 49 = 153.958$$

\* No penalty for using  $\pi$  from calculator .(153.93804)

\* If other variation of  $\pi$  used *Slip* (-1)

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$$\pi = \frac{22}{7} \text{ (154).} \quad \pi = 3.14 \text{ (153.86).} \quad \pi = 3.1 \text{ (151.9).} \quad \pi = 3 \text{ (147).}$$

*Blunders* (-3)

- B1 Correct answer without work.
- B2 Incorrect relevant formula. [  $\pi r$ ,  $2\pi r$  ]
- B3 Each incorrect or omitted substitution.
- B4 Mathematical error  $7^2 = 14$ .
- B5 Value of  $\pi$  not used in calculation.

*Slips* (-1)

- S1 Arithmetic error in calculation.
- S2 Decimal error.
- S3 Last step omitted.

*Misreadings* (-1)

- M1 Error in copying down a digit.

*Attempts* (3 marks)

- A1 Correct formula written and stops.
- A2 Correctly labelled diagram provided.
- A3 Special Case:  $7^2$  (oversimplification).

*Worthless* (0)

- W1 Incorrect formula with  $\pi$ .
- W2 Incorrect answer without work.



(c)(ii)

10 marks

Att 3



$$(c)(ii) V = l \times b \times h = 11 \times 4 \times 25 = 11 \times 4 \cdot 5 \times 25 = 1237.5$$

*Blunders (-3).*

- B1 Correct answer without work.
- B2 Calculates area of any side and stops.
- B3 Incorrect operator. (Divides instead of multiplying)
- B4 Incorrect substitution.

*Slips (-1)*

- S1 Calculates SA correctly.
- S2 Arithmetic error in calculation
- S3 Decimal error.

*Misreadings (-1)*

- M1 Error in copying down a digit.

*Attempts (3 marks)*

- A1 length  $\times$  breadth  $\times$  height.

*Worthless (0)*

- W1 Incorrect answer without work.
- W2  $11 \pm 4.5 \pm 25$ .
- W3 Incorrect formula with  $\pi$ .

## QUESTION 6

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

<b>Part (a)</b>	<b>10 marks</b>	<b>Att 3</b>
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Find the value of  $3x + 5$  when  $x = 4$ .

<b>(a)</b>	<b>10 marks</b>	<b>Att 3</b>
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$$(a) \quad 3(4) + 5 = 12 + 5 = 17$$

### *Blunders (-3)*

B1 Correct answer without work.

B2 Association error .e.g.  $3(4+5) = 3(9) = 27$ .

B3 Mathematical error.e.g.  $[3(4) + 5 = 34 + 5 = 39]$  or  $[3(4) + 5 = 7 + 5 = 12]$

### *Slips (-1)*

S1 Arithmetic error in calculation.

### *Misreadings (-1)*

M1 Error in copying down a component.

### *Attempts (3 marks)*

A1  $3x + 5 = 4$  and continues.

A2 Any correct step. e.g.  $3(4)$  & stops.

### *Worthless (0)*

W1 Incorrect answer without work.

W2 Any division.

Part (b)

10 marks

Att 3

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

$x$	1	2	3	4
$y$				

(ii) Using your answers from (i), draw the graph of  $y = 2x + 3$  from  $x = 1$  to  $x = 4$ .

(b)(i)

10 marks

Att 3



(b) (i)

$$x = 1 \Rightarrow y = 2(1) + 3 = 5$$

$$x = 2 \Rightarrow y = 2(2) + 3 = 7$$

$$x = 3 \Rightarrow y = 2(3) + 3 = 9$$

$$x = 4 \Rightarrow y = 2(4) + 3 = 11$$

$x$	1	2	3	4
$y$	5	7	9	11

\* Answers need not be written in table.

Blunders (-3)

B1 Correct answer without work.

B2 Treats  $2x$  as  $x$  [Does not multiply by 2 (once only)].

B3 Each entry omitted or incorrect. [Assuming at least **one correct** entry]

B4 Association error  $2 + x + 3$ .

B5 Mathematical error. e.g.  $y = 2(3) + 1$ .

*Slips (-1)*

- S1 Adds in top line of table.
- S2 Calculation error once if consistent.
- S2 Arithmetic error in calculation. (Max 3)

*Misreadings (-1)*

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

*Attempts (3 marks)*

- A1 Any one correct entry with /without work.

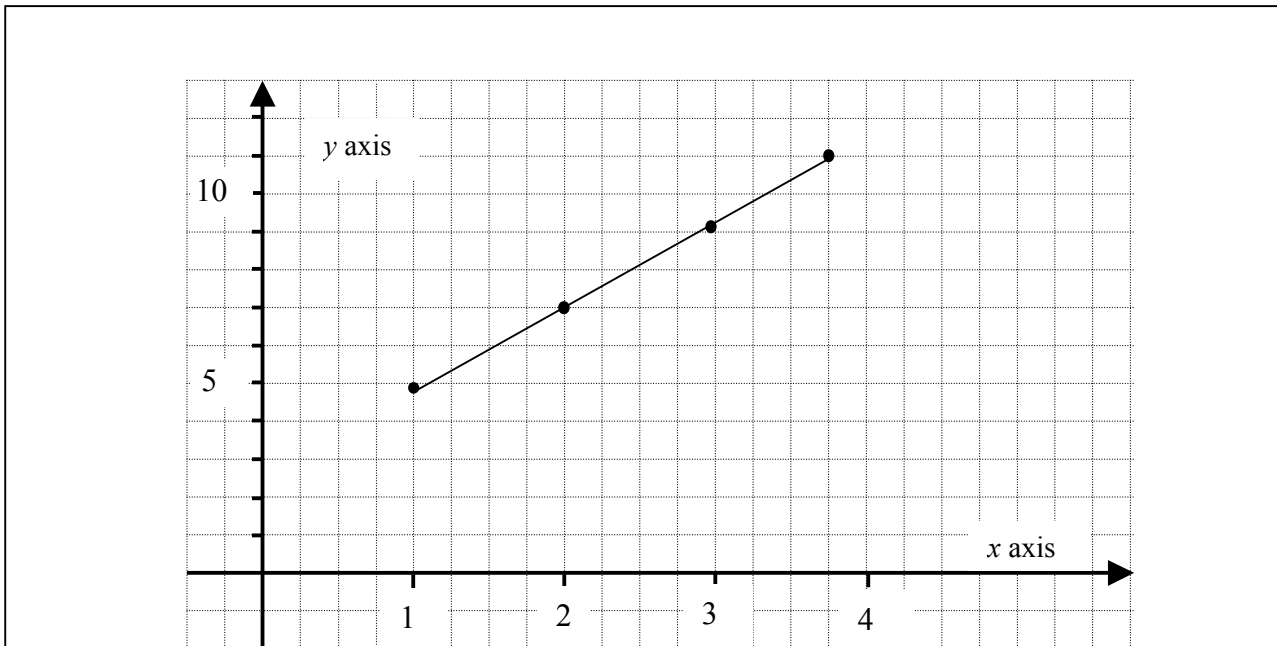
*Worthless (0)*

- W1 Table completed with spurious numbers.

**(b)(ii)**

**10 marks**

**Att 3**



- \* Accept candidate's value from (i).
- \* Tolerance  $\pm 0.5$  ( $\pm 1$ Box on grid)
- \* When **4 correct pts** are plotted and no marks awarded in (i) then Award **Att 3** in **part (i)**.
- \* M1(-1) only applies when at least **3 correct point** are plotted.

*Blunders (-3)*

- B1 Scale error. (once).
- B2 Draws histogram or bar chart.
- B3 Each incorrectly plotted point. [subject to S1].

*Slips (-1)*

- S1 (y,x) consistently drawn. (Penalise once only).
- S2 All points not joined.

*Misreadings (-1)*

- M1 Not using answer from part (i).

*Attempts (3 marks)*

- A1 Random straight line.
- A2 One correct point.

**Part (c)**

**20 (10,10)marks**

**Att (3,3)**

- (i) Simplify  $3(x+5) + 2(x-4)$ .
- (ii) Solve for  $x$ :  $6(x+5) = 42$

**(c)(i)**

**10 marks**

**Att 3**



$$\begin{aligned} \text{(c)(i)} \quad & 3(x+5) + 2(x-4) \\ & = 3x + 15 + 2x - 8 \\ & = 5x + 7 \end{aligned}$$

*Blunders (-3)*

- B1 Correct answer without work.
- B2 Distribution error. (once).
- B3 Mathematical error. (once) e.g.  $x+5$  as  $5x$
- B4 Fails to group.

*Slips (-1)*

- S1 Arithmetic error in calculation. (Max 3).

*Misreadings (-1)*

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

*Attempts (3 marks)*

- A1 Any correct step e.g.  $3x$  and stops or similar.
- A2 Particular Case: Substitutes a value for  $x$  into expression.

*Worthless (0)*

- W1 Incorrect answer without work.

(c)(ii)

10 marks

Att 3



(c)(ii) I  $6x + 30 = 42 \Rightarrow 6x = 42 - 30 \Rightarrow 6x = 12 \Rightarrow x = 2$

or

II  $x + 5 = \frac{42}{6} \Rightarrow x + 5 = 7 \Rightarrow x = 7 - 5 \Rightarrow x = 2$

\* Accept successful T/E with work.

*Blunders (-3)*

B1 Correct answer without work.

B2 Distribution error. (once)

B3 Transposition error (each time). e.g. Method II  $x + 5 = 42 - 6 \rightarrow x = 36 - 5 \rightarrow x = 31$

B4 Mathematical error. e.g.  $x + 5$  as  $5x$

B5 Ignores 6 and continues.

*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 Any relevant step. e.g.  $6x$  and stops or similar.