



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

**LEAVING CERTIFICATE  
APPLIED  
2009**

**MARKING SCHEME**

**MATHEMATICAL  
APPLICATIONS**

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**LEAVING CERTIFICATE APPLIED, 2009**

**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 is shown by the candidate.

## QUESTION 1

<b>Part (a)</b>	<b>5 marks</b>	<b>Att 2</b>
<b>Part (b)</b>	<b>5 marks</b>	<b>Att 2</b>
<b>Part (c)</b>	<b>5 marks</b>	<b>Att 2</b>
<b>Part (d)</b>	<b>5 marks</b>	<b>Att2</b>
<b>Part (e)</b>	<b>5 marks</b>	<b>Att 2</b>
<b>Part (f)</b>	<b>5 marks</b>	<b>Att 2</b>
<b>Part (g)</b>	<b>5 marks</b>	<b>Att 2</b>
<b>Part (h)</b>	<b>5 marks</b>	<b>Att 2</b>
<b>Part (i)</b>	<b>5 marks</b>	<b>Att 2</b>
<b>Part (j)</b>	<b>5 marks</b>	<b>Att 2</b>

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

Find 72% of €382.28

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

**(a)** 
$$\begin{aligned} \text{€}382.28 \times 72\% &= \text{€}275.2416 \\ &= \text{€}275.24 \end{aligned}$$

\*Accept answer in cent form but must indicate this

\*Accept correct answer with no work

*Misread (-1)*

M1 Gets 27% (€103.2156)

*Blunders (-3)*

B1: Inverts 72% (€530.94444)

B2: Inverts €382.28(€0.0018834)

B3: Misplaced decimal.

*Slips (-1)*

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

S2: Failure to round or incorrect rounding

S3: Evaluates 172% (€657.52)

S4: Calculates 28% (€107.03)

S5: Incorrect or omitted units

*Attempts (2 marks)*

A1:  $72 \pm 382.28$  (€454.28 or €310.28)

**Part (b)**

**5 marks**

**Att 2**

The respective heights of five students are 143cm, 160cm, 156cm, 157cm and 166cm.  
What is the mean height of the five students?

**(b)**

**5 marks**

**Att 2**

**(b)**  $143+160+156+157+166 = 782 \div 5 = 156.4\text{cm.}$

\*Accept correct answer with no work

*Blunders (-3)*

B1: Misplaced decimal

B2: Multiplies the total by 5 (3910)

B3: Omission of division (782)

*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 156 or 157 with work

S5: Answer =  $782/5$

*Attempt (2)*

A1: Any indication of addition

A2: Multiplies one of the heights by 5

A3: List evident. finds median

*Worthless (0)*

W1: Multiplies heights only

W2: Answer = 5.

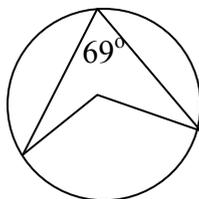
W3: Any of the listed numbers with no work

**Part (c)**

**5 marks**

**Att 2**

Calculate  $A$ .



**(c)**

**5 marks**

**Att 2**

**(c)**  $69^\circ \times 2 = 138^\circ$

\*Accept correct answer with no work

*Blunders (-3)*

B1: Answer =  $69^\circ \div 2 = 34.5^\circ$

*Slips (-1)*

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

S2: Incorrect or omitted units

S3: Applied incorrect geometric relationship ( $180^\circ - 69^\circ = 111^\circ$  or  $360^\circ - 69^\circ = 291^\circ$ )

*Attempts (2)*

A1: Answer =  $90^\circ$  or  $180^\circ$  or  $360^\circ$  without work

*Worthless (0)*

W1: Answer =  $69^\circ$  and stops

**Part (d)**

**5 marks**

**Att 2**

(d) Calculate  $2\frac{1}{3} \times 1\frac{5}{6}$

(d)

**5 marks**

**Att 2**

(d)  $2\frac{1}{3} \times 1\frac{5}{6} = \frac{7}{3} \times \frac{11}{6} = \frac{77}{18} = 4\frac{5}{18} = 4.277777778$

\*Accept correct answer with no work

\*Accept answer in decimal form

\*Accept answer =  $\frac{77}{18}$  or any equivalent of  $\frac{77}{18}$

*Blunders (-3)*

B1: Misplaced decimal

B2: Incorrect denominator or numerator

B3: Divides fractions

*Slips (-1)*

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

*Attempts (2)*

A1: Adds or subtracts the fractions

A2: Answer =  $2\frac{5}{18}$  or  $2\frac{6}{9}$

A3: Answer = 2 and any fraction except  $2\frac{1}{3}$

**Part (e)**

**5 marks**

**Att 2**

(e) A carton contains 2 litres of juice. A full glass holds 250 ml.  
How many full glasses of juice can be filled from this carton?

(e)

**5 marks**

**Att 2**

(e) 2 litres = 2000ml.  $2000 \div 250 = 8$  glasses OR  $2 \div .25 = 8$

*Blunders (-3)*

B1: Incorrect conversion from litres to millilitres

B2: Misplaced decimal

B3: Multiplies by 250 + possible B1

B4: Inverts  $\frac{250}{2000}$

*Slips (-1)*

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

*Attempts (2)*

A1: Answer =  $2 \pm 250$

A2: Answer =  $250/2 = 125$

A3: Answer = 2000ml

**Part (f)**

**5 marks**

**Att 2**

**(f)** Helen's rate of pay is €9.40 per hour.  
Overtime is paid at 'time and a half'  
How much will Helen get paid for 4.5 hours of overtime?

**(f)**

**5 marks**

**Att 2**

**(f)** Overtime rate =  $€9.40 \div 2 = €4.70$   
 $= €9.40 + €4.70 = €14.10$   
 $= 4.5 \times €14.10 = €63.45$

\*Accept correct answer with no work

*Blunders (-3)*

B1: Fails to calculate overtime rate correctly

B2: Divides by 4.5 hours

B3: Having calculated the overtime rate fails to calculate for 4.5 hours + B2

B4: Ignores the overtime rate + B1 ( $9.40 \times 4.5 = €42.30$ )

B5: Misplaced decimal

*Slips (-1)*

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

S2: Failure to round or incorrect rounding

S3: Incorrect or omitted units

*Attempts (2)*

A1: Answer =  $€9.40 \pm 4.5$  correct or incorrect (13.90 / 4.90)

A2: Answer = €4.70

*Worthless (0)*

W1: Answer = €9.40

**Part (g)**

**5 marks**

**Att2**

(g) €2600 is divided between Michael and Billy in the ratio 3:2.  
How much does Billy receive?

(g)

**5 marks**

**Att 2**

(g) 
$$€2600 \times \frac{2}{5} = \frac{5200}{5} = €1040$$

\*Accept correct answer with no work

*Blunders (-3)*

B1: Calculates  $\frac{1}{5}$  only (€520)

B2: Inverts  $\frac{2}{5}$  ( $€2600 \times 5 \div 2 = €6500$ )

B3: Inverts €2600

B4: Answer =  $€2600 \div 2$  only (€1300)

B5: Answer =  $€2600 \times 2$  and stops (€5200) or  $2600 \times 3$  (7800)

B6: Misplaced decimal

*Slips (-1)*

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

S2: Failure to round or incorrect rounding

S3: Incorrect or omitted units

S4: Calculates  $\frac{3}{5}$  only (€1560 ie Michael's share)

*Attempts (2)*

A1:  $3+2 = 5$  only and stops

A2:  $€2600 \div 3.2 = €812.5$

A3:  $2600 \times 3.2 = 8320$

*Worthless (0)*

W1:  $€2600 \pm 2$  (2602/2598)

W2:  $€2600 \pm 3$  (2603/2597)

W3: Answer = 2

**Part (h)**

**5 marks**

**Att2**

**(h)** There are 6 red balls and 5 black balls in a bag.  
A ball is chosen at random from the bag.  
What is the probability that the chosen ball is red?

**(h)**

**5 marks**

**Att 2**

**(h)**  $\frac{6}{11}$

\*Accept 6:11, 6 in 11, 6 out of 11, 6 of 11, .54545454545 (decimal answer) or 54% or 55%

*Blunders (-3)*

B1: No fraction or ratio set up

B2: Answer = 6 + B1

B3: Answer = 11 + B1

B4: Answer =  $\frac{11}{6}$

B5: Answer = 6 to 11

B6: Answer =  $\frac{1}{11}$

*Slips (-1)*

S1: Answer =  $\frac{5}{11}$  (0.45454545)

S2: Answer in decimal form truncated

*Attempts (2)*

A1: Any proper fraction other than  $\frac{6}{11}, \frac{11}{6}, \frac{1}{11}, \frac{5}{11}$

A2: Answer =  $\frac{5}{6}$

A3: Answer = 1:6

A4: Answer = 1 in 6

A5: Any use of 6 except B2 above

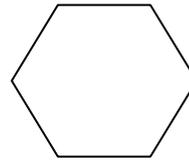
A6: Answer 1-11

**Part (i)**

**5 marks**

**Att2**

- (i) A regular hexagon has side of 8.36 cm.  
Find its perimeter.



**(i)**

**5 marks**

**Att2**

- (i)  $8.36 \times 6 = 50.16\text{cm.}$

\*Accept correct answer with no work

*Blunders (-3)*

B1: Inverts 8.36 and continues (.7177)

B2: Divides by 6 (1.3933333)

B3: Misplaced decimal

B4: Calculates area  $8.36 \times 8.36 = 69.8896$

B5: Each side omitted to a max of 4

B6: Answer =  $8.36 + 8.36 + 8.36 + 8.36 + 8.36 + 8.36$  and stops or  $8.36 \times 6$  and stops

B7: Answer =  $8.36 + 6 = 14.36$

*Slips (-1)*

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

S2: Incorrect or omitted units

*Attempt (2)*

A1: Any use of 6

A2: Indicates lengths on all sides on diagram

*Worthless (0)*

W1: Answer = 8.36cm

W2: Answer =  $8.36 \div 2$  (4.18)

**Part (j)**

**5 marks**

**Att 2**

- (j) Write the number 54 599 correct to the nearest thousand

**(j)**

**5 marks**

**Att 2**

- (j) 55 000

*Blunders (-3)*

B1: Misplaced decimal

B2: Answer = 55 599

B3: Answer = 54 000

B4: Answer = 60 599

*Misread (-1)*

M1: Rounds to the nearest hundred (54 600)

M2: Rounds to the nearest ten thousand (50 000)

*Attempt (2)*

A1: Answer = 60 000

A2: Answer = 54 500

*Worthless (0)*

W1: Answer = 54.599

## QUESTION 2

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

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

- (a) Local time in New York is 5 hours behind local time in Dublin.  
The estimated flight time between these two cities is six hours.  
Calculate the estimated time of arrival in New York and fill your answer on the above ticket.

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

- (a) Departs at 10:00 + 6 hours = 16:00 – 5 hours = 11:00am  
or 11:00

\*Must indicate morning

### *Blunders (-3)*

B1: 1 hour = 100 minutes

B2: Fails to subtract 5 hour time difference

B3: Answer =  $10 + 6 = 16:00$  and stops + B2

B4: Answer =  $10 - 6 = 04:00$  and continues

B5: Answer = 21:00 (10+6+5)

### *Slips (-1)*

S1: Fails to indicate morning

### *Misread (-1)*

M1: Answer =  $10 + 5 = 15:00 - 6 = 9:00\text{am}$

### *Attempt (2)*

A1: Answer =  $5 + 6 = 11$  and stops

A2: Answer = 5:00 or 5 am

### *Worthless (0)*

W1: Answer = 5 or 6

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

(b) Fill in the cost of the Taxes and Charges on the above ticket.

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

$$835.36 + 18.00 + 18.00 + 12.00 = 883.36$$

$$1044.20 - 883.36 = €160.84$$

*Blunders (-3)*

B1: Each cost omitted

B2: Fails to subtract from total price (€883.36)

B3: Adds instead of subtracts (1927.56)

B4: Misplaced decimal

B5: Each excess cost

*Slips (-1)*

S1: Each numerical error to a max of -3

S2: Failure to round or incorrect rounding

*Attempt (3)*

A1: Answer = 1 of the costs

**Part (c)** **15 marks** **Att 5**

(c) The family has €2000 spending money.  
Given an exchange rate of €1=\$US1.54, convert €2000 to US dollars.

(c) **15 marks** **Att 5**

(c) 
$$€2000 \times \$1.54 = \$3080$$

\*Accept correct answer with no work

*Blunders (-3)*

B1: Divides by \$1.54, answer =1298.70

B2: Inverts €2000 (-00077)

B3: Misplaced decimal

*Slips (-1)*

S1: Each numerical error to a max of -3

S2: Failure to round or incorrect rounding

*Attempts (5)*

A1: €2000±\$1.54 (2001.54/1998.46)

**Part (d)**

**5 marks**

**Att 2**

The family spends \$US 1078.00 on accommodation and meals.

Calculate the percentage of the family's spending money that this represents.

**(d)**

**5 marks**

**Att 2**

**(d)**  $\frac{1078}{3080} \times 100 = 35\%$

\*Accept correct answer with no work

\*Accept candidate's answer from part (c)

\*Special case  $1078 \times 3080$  (or candidates ans from (c))  $\times 100 = 3320240$  (7 marks)

*Blunders (-3)*

B1: Inverts (285.71428)

B2: Misplaced decimal

B3: Uses incorrect denominator and continues ( e.g.  $\frac{1078}{1044.20} \times 100 = 103.236$

or  $\frac{1078}{2000} \times 100 = 53.9$ )

B4: Uses incorrect numerator and continues

*Attempts (2)*

A1: No ratio or fraction set up eg  $1078 \times 100$

A2: Some work with 100 eg  $1078 \div 100$  or  $3080 \div 100$

**Part (e)**

**15 marks**

**Att 5**

(e) The temperature in New York is 77° Fahrenheit.  
Convert 77° Fahrenheit to degrees Celsius.

(e)

**15 marks**

**Att 5**

$$C = \frac{5(77^\circ - 32^\circ)}{9}$$

$$C = \frac{5}{9}(45^\circ)$$

$$C = 25^\circ$$

\*Accept correct answer with no work

*Blunders (-3)*

B1: Ignores order of operation

B2: Mishandles  $\frac{5}{9}$

B3: Misplaced decimal

B4: Incorrect substitution and continues

*Misread (-1)*

M1: Adds  $77^\circ + 32^\circ$  and continues

*Slips (-1)*

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

S2: Incorrect or omitted units (degrees only)

*Attempts (5)*

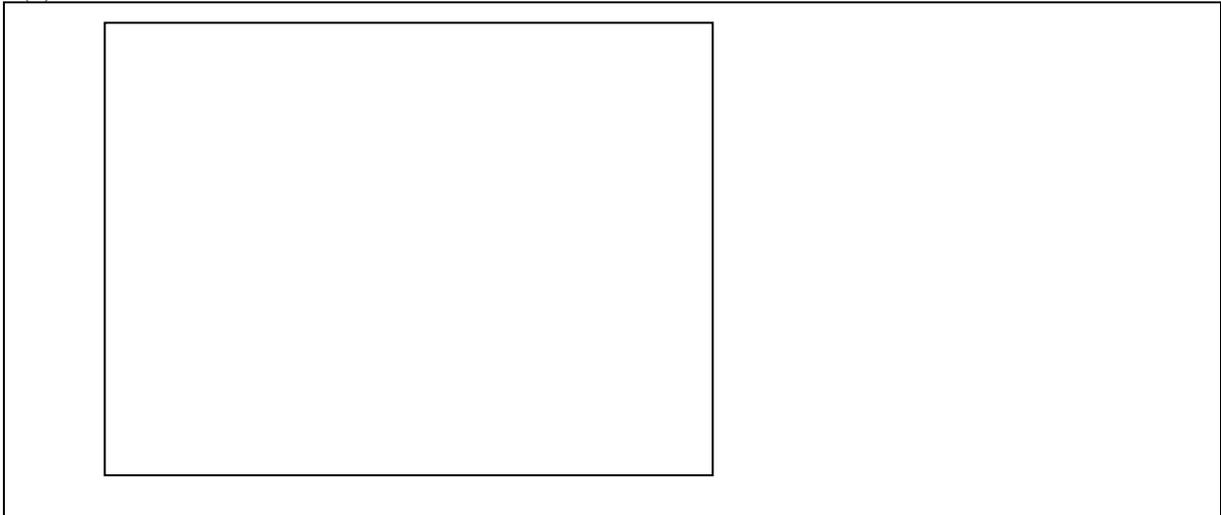
A1: Substitutes for F, correctly or incorrectly, and stops

### QUESTION 3

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

(a) Construct a rectangle 8 cm long and 6 cm wide.

(a) 15 marks Att 5



\*Tolerance  $\pm 0.1$  cm

\*Tolerance  $\pm 3^\circ$

\*Accept width = 8 cm and length = 6 cm

#### *Blunders (-3)*

B1: Each side of rectangle omitted to a max. of -6

B2: Side outside tolerance of 0.5cm, applied once to 8's and applied once to 6's

B3: Angle not between  $80^\circ$  and  $100^\circ$  once only

B4: 3 correct sides drawn only

#### *Slips (-1)*

S1: Incorrect units

S2: Each side outside tolerance of 0.1 cm applied once to 8's and once to 6 unless B2

#### *Attempts (5)*

A1: Only one side drawn, correctly or incorrectly.(straight edge)

A2: Rectangle not drawn with straight edge (hand drawn)

**Part (b)**

**15 marks**

**Att 5**

**(b)** Calculate the area of the rectangle.

**(b)**

**15 marks**

**Att 5**

**(b)**  $8 \times 6 = 48 \text{ cm}^2$

\*Accept correct answer with no work

\*Accept candidate's answer from part (a)

*Blunders (-3)*

B1: Incorrect length or width and continues

B2:  $8 \times 6$  and stops + possible S2

B3: Misplaced decimal

B4: Calculates perimeter (28)

B5: Divides to get area

B6:  $8 \times 6 \times 8 \times 6 = 2304$

*Slips (-1)*

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

S2: Incorrect or omitted units

*Attempts (5)*

A1: Answer =  $8 + 6$  or  $8 + 8$  or  $6 + 6$

*Worthless (0)*

W1: Answer = 8 or 6 not relevant to candidate's answer from (a)

**Part (c) (i)**

**5marks**

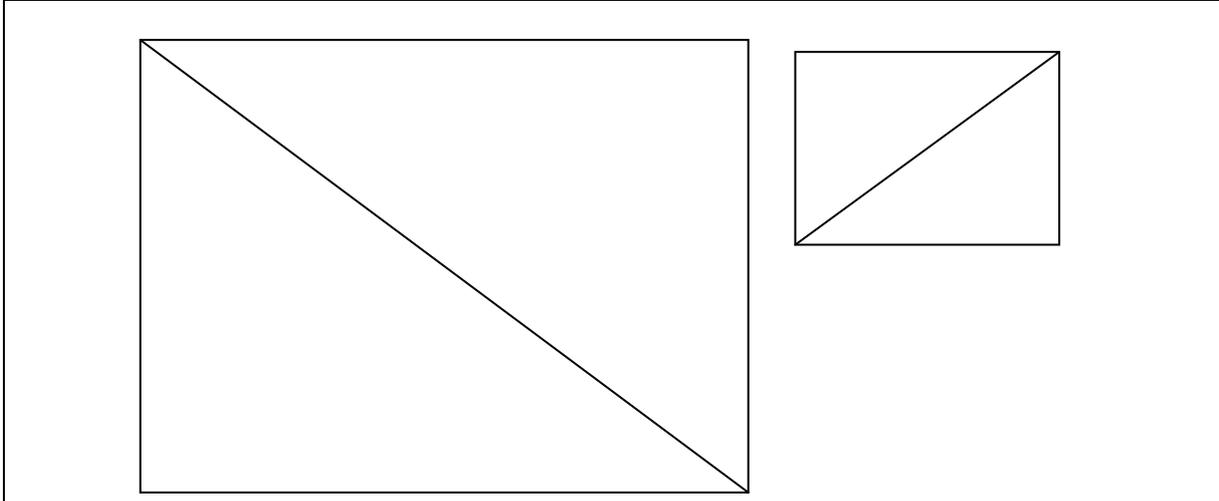
**Att 2**

**(a)** Draw a diagonal of the rectangle you have drawn in part (a)

**(c) (i)**

**5marks**

**Att 2**



\*Accept candidates diagram from part (a)

*Blunders (-3)*

B1: Labels one of the sides of the rectangle as the diagonal

B2: Diagonal = a line parallel to one of the sides of the rectangle

B3: Diagonal not joining two vertices of the rectangle + possible B2

*Slips (-1)*

S1: Diagonal contains one vertex only

*Attempts (2)*

A1: A line drawn outside the rectangle

**Part (c) (ii)**

**5marks**

**Att 2**

**(c) (ii)** Measure the length of the diagonal

**(c) (ii)**

**5marks**

**Att 2**

**(c) (ii)** Diagonal = 10cm

\*Accept diagonal constructed in part (c) (i)

\*Accept correct answer with no diagonal drawn

\*Tolerance =  $\pm 0.1$

*Blunders (-3)*

B1: Diagonal measured outside the tolerance of 0.5 cm

*Slips (-1)*

S1: Diagonal measured between tolerance of 0.1 and 0.5 cm

S2: Incorrect or omitted units

*Worthless (0)*

W1: Incorrect answer with no diagram

W2: Answer = 6 or 8 not relevant to candidate's diagram

**Part (d)**

**5 marks**

**Att 2**

- (b)** Use the theorem of Pythagoras to check your answer to part (c).  
The theorem of Pythagoras states:  
“In a right angled triangle, the square on the hypotenuse is equal to the sum of the square on the other two sides”

**(d)**

**5 marks**

**Att 2**

**(d)**

$$10^2 = 8^2 + 6^2$$
$$100 = 64 + 36$$
$$100 = 100$$

\*Accept candidate's answer from part (c)

*Blunders (-3)*

- B1: Max. error in the application of Pythagoras
- B2: Correct substitution and stops
- B3:  $10^2 = 2(10)$  and continues
- B4: Misplaced decimal
- B5: No hypotenuse and continues
- B6: Uses 3,4,5 as sides and continues

*Slips (-1)*

- S1: Each numerical error to a max of -3
- S2: Incorrect conclusion e.g.  $36=100$  or  $64=100$

*Attempts (2)*

- A1: Constructs square on one or all sides of a triangle and stops
- A2: States triangle is 6,8,10 and Pythagoras works
- A3: States it is true as triangle is right angled
- A4: Correct conclusion no work

Part (e)

5 marks

Att 2

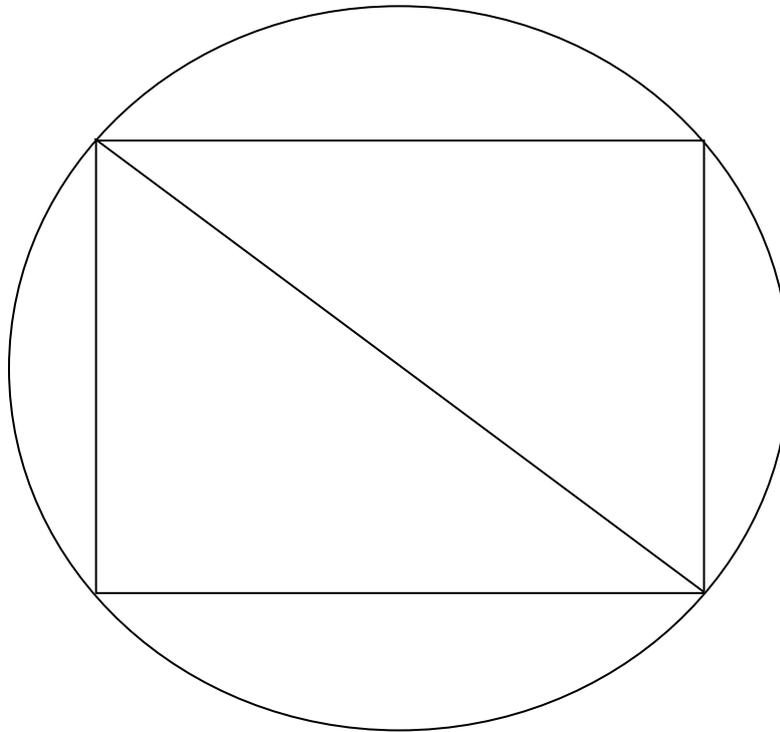
Construct, on your diagram, a circle with the mid-point of the diagonal as centre, and with the diagonal as diameter.

(e)

5marks

Att 2

(e)



\*Accept diagonal constructed for part (d)

\*Tolerance of  $\pm 0.1$  cm

*Blunders (-3)*

B1: Uses vertex as centre

B2: Radius outside the tolerance of 0.5 cm

B3: Uses diagonal length as radius

B4: Centre outside tolerance of 0.5 cm

*Slips (-1)*

S1: Radius between tolerance 0.1 and 0.5 cm

S2: Centre between tolerance of 0.1 and 0.5 cm

S3: Incorrect units

*Misreading (-1)*

M1: Draws a semi-centre

*Attempts (2)*

A1: Draws circle free hand relevant to the rectangle

A2: Marks in centre only

A3: Circle drawn independently of rectangle

*Worthless (0)*

W1: Free hand circle independent of rectangle

## QUESTION 4

<b>Part (a)</b>	<b>10marks</b>	<b>Att 3</b>
<b>Part (b)</b>	<b>10 marks</b>	<b>Att 3</b>
<b>Part (c)</b>	<b>10 marks</b>	<b>Att 3</b>
<b>Part (d)</b>	<b>10 marks</b>	<b>Att 3</b>
<b>Part (e)</b>	<b>10 marks</b>	<b>Att 3</b>

Five Candidates stood for election to Dáil Éireann in a 3 seat constituency.  
The election was conducted under the PR system.  
The total electorate as contained in the 'Register of Electors' was 27 800.  
The total poll was 21 430.  
The number of spoiled votes (votes which were invalid) was 310.

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

**(a)** Calculate the valid poll

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

**(a)** Valid poll =  $21\,430 - 310 = 21\,120$

\*Accept correct answer with no work

### *Blunders (-3)*

B1: Adds instead of subtracts

B2: Total poll  $\neq$  21 430, but a relevant number

B3: Spoiled votes  $\neq$  310, but a relevant number

B4: Answer =  $310 - 21\,430$  (20880)

### *Slips (-1)*

S1: Each numerical error to a max of -3

### *Attempts (3)*

A1: Answer =  $310 \times 21\,430$  (6643300)

A2: Answer =  $21\,430 \div 310$  (69.129032)

A3: Answer = 310 or answer = 21 430

A4: Answer =  $27800 + 21430 = 49230$

A5: Answer =  $27800 - 21430 = 6370$

### *Worthless (0)*

W1:  $27800 \div 3 = 9266.66$

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

**(b)** Calculate the quota, using the quota formula:  
Quota = Valid Poll ÷ (number of seats + 1) + 1

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

**(b)** 
$$\text{Quota} = \frac{21120}{3+1} + 1 = 5281$$

\*Accept correct answer with no work

\*Accept candidate's answer from part (a)

*Blunders (-3)*

B1: Ignores the second +1 in the formula (5280)

B2: Incorrect substitution unless S2

B3: Mishandles the lower line. e.g.  $(21\ 120 \div 3) + 1 + 1 = 7042$  or  $21120 \div 5 = 4224$

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  $\neq 3$

S3: Incorrect rounding or failure to round

*Attempts (3)*

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

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

**(c)** On the first count candidate A received 5620 first preference votes.  
How many surplus votes did candidate A receive?

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

**(c)** 
$$5620 - 5281 = 339 \text{ votes}$$

\*Accept correct answer with no work

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

*Blunders (-3)*

B1: Adds instead of subtracts (10 901)

B2: Answer = valid poll  $21\ 120 - 5620 = 15\ 500$

*Slips (-1)*

S1: Each numerical error to a max of -3

*Attempts (3)*

A1: Any relevant number  $\pm 5620$

A2: Answer =  $5620 \div 3 = 1873.3333$

**Part (d)**

**10 marks**

**Att 3**

- (d)** The selling price of an electric drill, including V.A.T., is €307.50.  
Before V.A.T. is added, the price of the drill is €250.00  
Calculate the percentage V.A.T rate used.

**(d)**

**10 marks**

**Att 3**

$$\begin{array}{l} \text{€}307.50 - \text{€}250.00 = \text{€}57.50 \quad \text{OR} \quad 250 = 100\% \\ \frac{57.50}{250.00} \times 100 = 23\% \quad \quad \quad 307.50 = ?\% \\ \quad 100 \times 307.50 \div 250 = 123\% \\ \quad 123\% - 100\% = 23\% \end{array}$$

\*Accept correct answer with no work

*Blunders (-3)*

B1: Inverts (434.7826)

B2: Incorrect denominator having calculated €57.50 and continues

B3: Incorrect numerator and continues

B4: Adds €307.50 +250.00 and continues

B5: Having calculated €57.50 multiplies by 250 and continues (143.75)

B6: Misplaced decimal

*Slips(-1)*

S1: Answer =123%

*Attempt (3)*

A1: Answer = €57.50 and stops

*Worthless (0)*

W1: Answer = €307.50

W2: Answer = €250

W3: Answer not related to numbers above

**Part (e)**

**10 marks**

**Att 3**

(e)

The V.A.T. rate is changed to 15%,  
Calculate the new selling price of the electric drill

(e)

**10 marks**

**Att 3**

$$\begin{aligned} \text{€}250.00 \times 15 \div 100 &= \text{€}37.50 & \text{OR} & \quad 250 \times 115 \div 100 = \text{€} 287.50 \\ \text{€}250.00 + \text{€}37.50 &= \text{€}287.50 \end{aligned}$$

\*Accept correct answer with no work

*Blunders (-3)*

B1: Inverts ( $15 \div 250 \times 100 = 6$  or  $250 \times 100 \div 15 = 1667.66$ )

B2: Misplaced decimal

B3: Answer = €37.50 and stops

B4: Answer = €250 - €37.50 (212.50)

B5: Answer =  $307.50 \times 15 \div 100 = 46.125$  accept €46.12 or €46.13 + B3

*Slips (-1)*

S1: Adds rate in (d) + 15% and continues

S2: Adds €307.50 + €37.50 (€345)

S3: Incorrect or omitted units

*Attempt (3)*

A1: Gets 15% of a relevant number and stops.

## QUESTION 5

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

Fill in the five missing details on the electricity bill below:

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

<b>(a)(i)</b>	Units	$65649 - 64663 = 986$
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\*Accept correct answer with no work

*Blunders (-3)*

B1: Adds instead of subtracts. (130312)

*Slips (-1)*

S1: Each numerical error to a max of -3

*Attempt(3)*

A1: Answer = 65649

A2: Answer = 64663

A3: Answer =  $65649 \times 64663 = 42450612$  or  $65649 \div 64663$

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

<b>(a)(ii)</b>	Units and rate	$986 \times \text{€}0.1597 = \text{€}157.4642$ $= \text{€}157.46$
----------------	----------------	--

\*Accept correct answer with no work

\*Accept candidate's answer from part (a) (i)

*Blunders (-3)*

B1: Divides by 0.1597 (6174.0763)

B2:  $65649 \times 0.1597$  (10484.145) or  $64663 \times 0.1597$  (10326.681) subject to 2<sup>nd</sup>\*

B3: Misplaced decimal

*Slips (-1)*

S1: Each numerical error to a max of -3

S2: Failure to round or incorrect rounding

*Attempt (2)*

A1:  $986 \pm 0.1597$  (986.1597/985.8403)

A2:  $6.88 \times 0.1597$  (1.098736)

**(a)(iii)**

**5 marks**

**Att 2**

<b>(a)(iii)</b> €157.46 +6.88+3.02 = €167.36
--

\*Accept correct answer with no work

\*Accept candidate's answer from part (a)(ii)

*Blunders(-3)*

B1: Ignores 6.88 and continues

B2: Ignores 3.02 and continues

B3: Subtracts instead of adding

B4: Each charge omitted

*Misread (-1)*

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

*Slips(-1)*

S1: Each numerical error to a max of -3

S2: Failure to round or incorrect rounding

S3: Answer written in box (iv)

*Attempt(2)*

A1: Answer = 6.88 or 3.02 or 9.90 or 3.86

A2: Candidates answer from (a)(ii)

**(a)(iv)**

**5 marks**

**Att 2**

<b>(a)(iv)</b> VAT @ 13.5% 13.5%×€167.36=22.5936 = €22.59
---

\*Accept correct answer with no work

\*Accept candidate's answer from part (a)(iii)

*Blunders (-3)*

B1: Inverts €167.36 (.0008066)

B2: Inverts 13.5% (1239.7037)

B3: Misplaced decimal

*Slips (-1)*

S1: Each numerical error to a max of -3

S2: Failure to round or incorrect rounding.

S3: Evaluates 113.5% (189.95360)

*Attempt (2)*

A1: Calculates 13.5% of a relevant number

(a)(v)

5 marks

Att 2

(a)(v)	Total	$€157.46+6.88+3.02+22.59 = €189.95$
	OR	$167.36+22.59 = €189.95$

\*Accept correct answer with no work

\*Accept candidate's answer from previous parts

*Blunders (-3)*

B1: Each cost omitted

B2: Each extra cost included

B3: Misplaced decimal

B4: Subtracts instead of adds.

*Slips (-1)*

S1: Each numerical error to a max of -3

S2: Failure to round or incorrect rounding.

S3: Subtracts VAT

*Misread (-1)*

M1: If 113.5% filled in part (iv) and part (v)

M2: Part (iv) blank but correct answer in part (v)

Part (b)

20 marks

Att 7

Sheila borrows €8000 at the rate of 10.75% per annum compound interest. How much will Sheila owe at the end of 3 years if she makes no repayments in the meantime?
--

(b)

20 marks

Att 7

(b)A= $8000\left(1 + \frac{10.75}{100}\right)^3$	OR	Principal 1 <sup>st</sup> year = 8000
A= $8000(1.1075)^3$		Interest 1 <sup>st</sup> year = 860
A= $8000(1.358411047)$		Principal 2 <sup>nd</sup> year = 8860
A= 10 867.28838		Interest 2 <sup>nd</sup> year = 952.45
A= €10 867.29		Principal 3 <sup>rd</sup> year = 9812.45
		Interest 3 <sup>rd</sup> year = 1054.84
		Amount = €10867.29

\*Accept correct answer with no work

\*Allow candidate to calculate on a yearly basis

\*Note: If compound interest is calculated on a yearly basis blunder for each omission of interest calculation and each omission of amount calculation

*Blunders(-3)*

B1: Each incorrect substitution each time

B2:  $8000(1.1075)^3=(8860)^3$  and continues

B3:  $(1.1075)^3=3(1.1075)$  and continues.

B4:  $1 + \frac{R}{100} = (1+R) \div 100$  and continues

B5:  $1 + \frac{R}{100} = 1 \times \frac{R}{100}$  and continues

B6: Misplaced decimal

B7: Correct substitution and stops +B2+B3+B4

*Slips(-1)*

S1: Each numerical error to a max of -3

S2: Incorrect or omitted units

S3: Failure to round or incorrect rounding

S4: Calculates interest only (€2867.29)

*Attempt(7)*

A1: Answer = €2580, using Simple Interest Formula

A2:  $8000 \times \frac{10.75}{100}$  and stops (860)

A3:  $8000 \times 3$  and stops (24000) or  $8000 \div 3 = 2666.66$

A4:  $10.75\% \times 3$  and stops (32.25)

A5: Any substitution into formula correct or incorrect.

## 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 níos mó ná 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 don pháipéar. Mar sin, bain úsáid as an ngnáthráta 5% i gcás iarrthóirí a ghnóthaíonn 150 marc nó níos lú, e.g.  $118 \text{ marc} \times 5\% = 5.9 \Rightarrow \text{bónas} = 5 \text{ marc}$ .

Má ghnóthaíonn an t-iarrthóir níos mó ná 150 marc, ríomhtar an bónas de réir na foirmle:  $[200 - \text{bunmharc}] \times 15\%$ , agus an marc bónais 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

