Question 1

(a) Is Fiachra more likely to score a point or a goal?

A point

(b) What is the probability that Fiachra will not score a point in this attempt?

1 - 0·6 = 0·4 (or $^{2}/_{5}$)

A player on Team B, Peadar, has the ball and attempts to score. The probability of Peadar scoring a point is 0·7 and the probability of him scoring a goal is 0·2.

(c) Peadar is more likely to score than Fiachra.
Give a reason why this is true.

0·7>0·5 (point) and
0·2>0·1 (goal)

(d) A spectator says "Peadar will always score more than Fiachra in a game between the two teams".

Do you agree with the spectator?

Yes ☐ No ☑

Give a reason for your answer.

While the probability of Peadar scoring is higher, it does not mean that he will score(or score more) in any particular game.

(e) A penalty is awarded to Team B.
The goalkeeper for Team A has saved 12 penalties out of 20 this season.

What is the probability that the goalkeeper will save the penalty based on his previous record?

$^{12}/_{20}$ = $^{3}/_{5}$ or 0·6

Question 2

Tan 30° = $^{x}/_{18}$

x = 18 tan 30

= 18(0·57735….)

= 10·3923

= 10·4 m

(b) What other information is needed to find the height of the house?

Jasmine's height

Question 3

(a) Write down the co-ordinates of the position of each item.

B = (2 , 7)

P = (**7** , **1**)

R = (**6** , **4**)

S = (**2** , **1**)

T = (**9** , **5**)

(b) Each square of the grid represents 1 m^2.
Find the total area of the grid.

$10 \times 10 = 100\ m^2$

(c) Which of the items is nearest to the tile (T)?

Ring (R)

(d) Find the distance between the brooch (B) and the statue (S).

6 (by inspection)

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(2-2)^2 + (7-1)^2} = \sqrt{36} = 6$$

(e) What is the slope of the line from the plate (P) to the brooch (B)?

$$\frac{7-1}{2-7} = -\frac{6}{5}$$

Question 4

Barra is comparing the cost of electricity supplied by two companies.
He used 510 units last month.

(a) Fill in the following tables:

GRIDPOWER	€
Standing charge	9·47
18·5 cent per unit	**94·35**
Sub-total	**103·82**
13·5% VAT	**14·02**
Total	**117·84**

ELECTROLINE	€
No standing charge	
First 50 units free Then 25 cent per unit	**115**
Sub-total	**115**
13·5% VAT	**15·53**
Total	**130·53**

510 × 18·5 = 94·35

510 – 50 = 460 × 0·25 = 115

(b) What is the difference between the bills of the two companies?

130·53 – 117·84 = €12·69

(c) Barra contacted the more expensive company. The company offered him a 10% discount off his total bill.
In your opinion, from which company should Barra get his electricity?
Give a reason for your answer.

Electroline

because its cheaper

130·53 - 10% = 117·48

117·84 – 117·48 = 36 cent difference

Note: Accept either company if a reasonable reason given

Question 5

(c)(i) **10 marks** **Att3**

$\frac{20000 \times 5.2}{100} = 1040 \quad 20000 + 1040 = €21040$ *or* $20000 \times 1.025 = 21040$

or

$1\% = \frac{20000}{100}$

$5.2\% = \frac{20000}{100} \times 5.2$

Interest = 1040

Amount = 20000 + 1040

Amount = 21040

or

$I = \frac{P \times R}{100}$

$I = \frac{20000}{100} \times 5.2$

Interest = 1040

Amount = 20000 + 1040

Amount = €21040

or

Amount = $20000 \times 1 \cdot 052$

Amount = €21040

Question 6

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

$3x + 6 + 12x + 4 = 15x + 10$

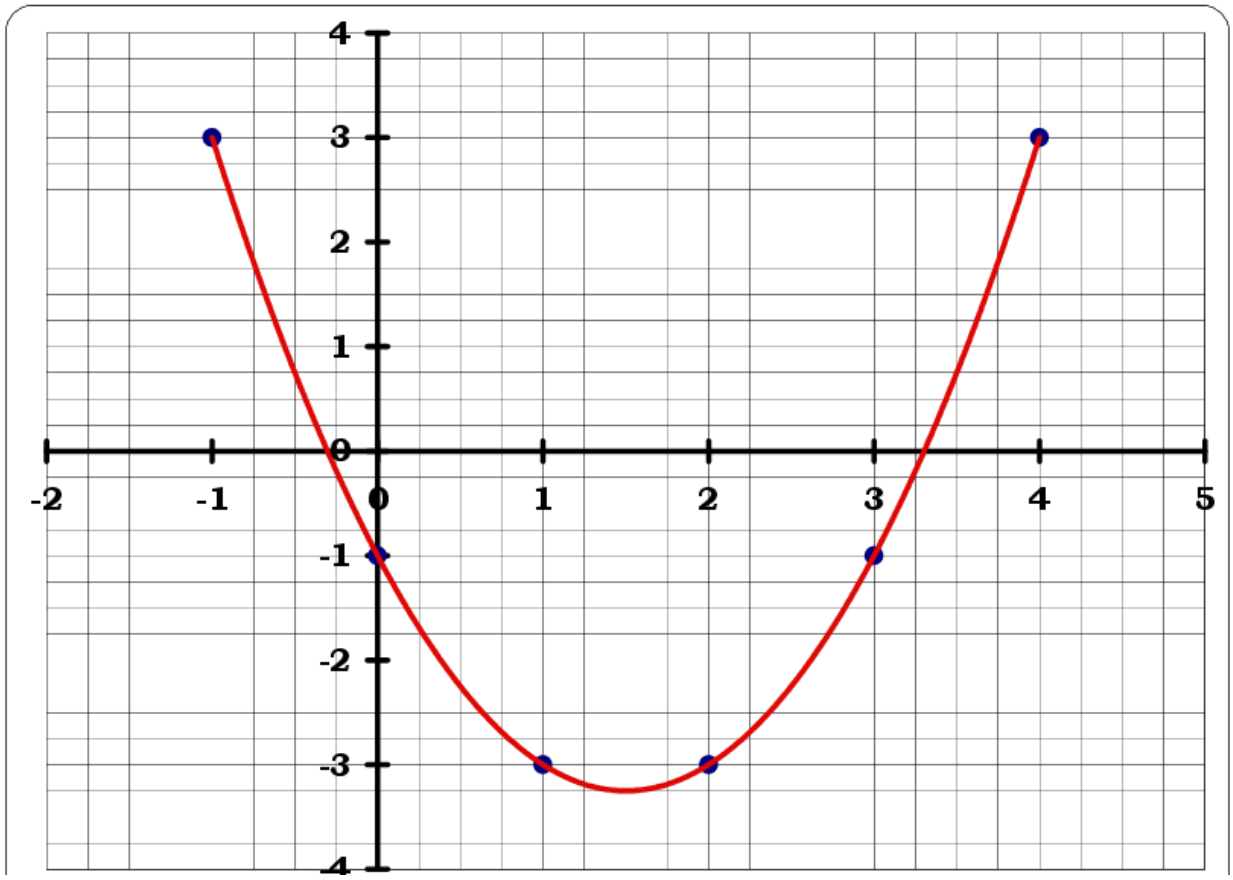
Question 7

Part (b) Table **15 marks** **Att 5**

$f(x)$	=	x^2	$-3x$	-1		
$f(-1)$	=	$(-1)^2$	$-3(-1)$	-1	=	**3**
$f(0)$	=	$(0)^2$	$-3(0)$	-1	=	**-1**
$f(1)$	=	$(1)^2$	$-3(1)$	-1	=	**-3**
$f(2)$	=	$(2)^2$	$-3(2)$	-1	=	**-3**
$f(3)$	=	$(3)^2$	$-3(3)$	-1	=	**-1**
$f(4)$	=	$(4)^2$	$-3(4)$	-1	=	**3**

x	**-1**	**0**	**1**	**2**	**3**	**4**
x^2	1	0	1	4	9	16
$-3x$	3	0	-3	-6	-9	-12
-1	-1	-1	-1	-1	-1	-1
$f(x)$	**3**	**-1**	**-3**	**-3**	**-1**	**3**

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



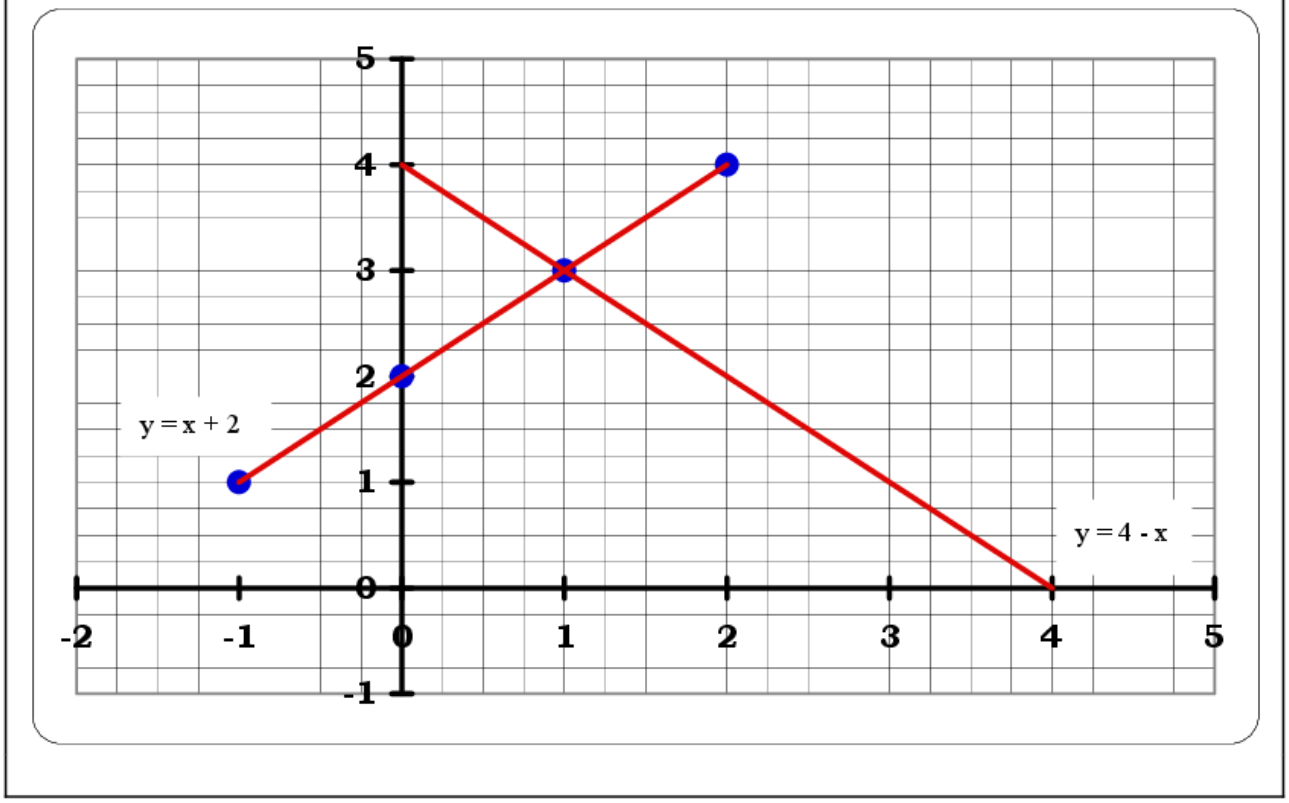
Part(c) (i) **5 marks** **Att 2**

x	-1	0	1	2
y	1	2	3	4

Part(c) (i) **5 marks** **Att 2**

x	-1	0	1	2
y	1	2	3	4

Part(c) (ii) Graph **5 marks** **Att 2**



Part(c) (iii) Intersection **5 marks** **Att2**

Point of intersection = (1, 3)

Question 8

Part (b) (i) **5 marks** **Att2**

$€1 = \$1.21$

$€? = \$6655$

$? = \frac{6655}{1.21} = €5500$

$\$1.21 = €1$

$\Rightarrow \$1 = € \frac{1}{1.21}$

$\Rightarrow \$6655 = 6655 \times \frac{1}{1.21} = €5500$

Question 9

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

Method 1

$100\% = 750$

$1\% = \frac{750}{100}$

$121\% = \frac{750}{100} \times 121$

$= 7.5 \times 121$

$Total\ bill = €907.5$

Method 2

$100\% = 750$

$1\% = \frac{750}{100}$

$21\% = \frac{750}{100} \times 21 = 157.50$

$Total\ Bill = 157.5 + 750 = €907.50$

Method 3

$21\% = \frac{21}{100}$

$V.A.T. = \frac{21}{100} \times 750.$

$Total\ bill = 157.5 + 750 = €907.5$

Method 4

$750 \times 1.21 = 907.5$

$Total\ bill = €907.50$

Question 11

Write down a subset of P that has one element

(i)

$\{x\}$ or $\{y\}$ or $\{w\}$

Question 12

* Accept 5790, $57 \cdot 90$ or $57 \cdot 9$ regardless of subsequent labelling or work.
* Final addition step subject to maximum deduction of –3.
* Adds $16 \cdot 50$ to $4 \cdot 20 = 20 \cdot 70$ and stops ⇒ 3 marks. [Oversimplification].
* Correct answer without work ⇒ 7 marks.

(i) Profit: €16 000 – €14 080 = €1920

Percentage of the selling price:

(ii)

1% = 60 5% = 300 Amount = €6300	$I = \frac{P \times T \times R}{100} = \frac{6000 \times 1 \times 5}{100} = 300$ Amount = €6300	6000×1·05 = 6300 Amount = €6300

(i) 1% = 6 20% = 120 Tax = €120.	$\text{Tax} = \frac{600}{100} \times 20 = €120$	600×0·2 = €120.

* Correct answer without work ⇒ 2 marks.
* Incorrect answer without work ⇒ 0 marks.

Blunders (–3)
B1 Mishandles 20%, e.g. 600×20 = 12000 or 600÷20 = 30.
B2 Uses €850 instead of €600.

Question 13

(a)(i) **5 marks** **Att2**

$a + 2b$
$=3+2(5)$
$=3+10$
$=13$

(a)(ii) **5 marks** **Att2**

$ab - 6$
$3(5) - 6$
$= 15 - 6$
$= \mathbf{9}$

Question 14

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

$3x - 6 = 2x + 5$
$3x - 2x = 6 + 5$
$\boldsymbol{x = 11}$

Question 15

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

12:57 – 09:45 = 3:12 or 3 hours 12 minutes

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

Speed = Distance /Time

Distance =200 km Time (3 hours 12 minutes) = 3·2 hours

$$\text{Speed} = \frac{200}{3 \cdot 2} = 62 \cdot 5 \text{ km/h}$$

(b) (iii) **5 marks** **Att 2**

200 × 22c = 4400c or €44

Question 16

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

$$|AB| = 110 - 65 = 45$$

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

Perimeter = 2×110m + 2× 55 m = 220 + 110 = 330 m

or

P = 55 +65+ 45 + 20 + 35 +110 = 330 m

(c) (iii) **5 marks** **Att 2**

Length Fencing = 330 – (35 +45) = 330 -80 = 250 m

Cost fencing = 250/5 × 62·50 =50 × 62·50 = €3125