

Question 1

(b) (i)

5 marks

Att 2

I

$$\frac{(3x-4)(2x-3)}{3x-4} = 2x-3$$

II

$$3x-4 \overline{) 6x^2 - 17x + 12}$$

$$\underline{6x^2 - 8x}$$

$$- 9x + 12$$

$$\underline{- 9x + 12}$$

$$0$$

III

$$(6x^2 - 17x + 12) \div (3x - 4)$$

$$(6x^2 - 9x - 8x + 12) \div (3x - 4)$$

$$[3x(2x - 3) - 4(2x - 3)] \div (3x - 4)$$

$$[(3x - 4)(2x - 3)] \div (3x - 4)$$

$$= 2x - 3$$

IV

$$(6x^2 - 17x + 12) \div (3x - 4)$$

$$(6x^2 - 8x - 9x + 12) \div (3x - 4)$$

$$[2x(3x - 4) - 3(3x - 4)] \div (3x - 4)$$

$$[(2x - 3)(3x - 4)] \div (3x - 4)$$

$$= 2x - 3$$

(b) (ii)

10 marks

Att 3

I		II	
$4c^2 - 3d - 2cd + 6c$	Given	$4c^2 - 3d - 2cd + 6c$	Given
$4c^2 + 6c - 2cd - 3d$	3m	$4c^2 - 2cd + 6c - 3d$	3m
$2c(2c + 3) - d(2c + 3)$	7m	$2c(2c - d) + 3(2c - d)$	7m
$(2c + 3)(2c - d)$	10m	$(2c - d)(2c + 3)$	10m

(b) (iii)

5 marks

Att 2

$$= \frac{\frac{5}{x-3} - \frac{3}{x-2}}{1}$$

$$= \frac{5(x-2) - 3(x-3)}{(x-3)(x-2)} \quad \mathbf{2m}$$

$$= \frac{5x - 10 - 3x + 9}{(x-3)(x-2)} \quad \mathbf{2m}$$

$$= \frac{2x - 1}{(x-3)(x-2)} \quad \mathbf{5m}$$

Question 2

(a)

10 marks

Att 3

I

$$4 - x \quad 2x - 5$$

$$4 + 5 \quad 2x + x$$

$$9 \quad 3x$$

$$9 \div 3 \quad x$$

$$3 \quad x$$

7m

II

$$4 - x \quad 2x - 5$$

$$-x - 2x \quad -5 - 4$$

$$-3x \quad -9$$

$$3x \quad 9$$

$$x \quad 9 \div 3$$

$$x \quad 3$$

7m

$$x \leq 3 \rightarrow \{1,2,3\} \quad 7m$$



10m

Question 3

(b) (i)

10 (5,5)marks

Att 2,2

$$x + y = 1100$$

5m

$$0.14x + 0.07y = 129.50 \quad \text{or} \quad 14x + 7y = 12950$$

5m

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

$$\begin{array}{r} x + y = 1100 \quad (-7) \\ \underline{14x + 7y = 12950} \end{array}$$

$$-7x - 7y = -7700$$

$$\underline{14x + 7y = 12950}$$

$$7x = 5250$$

$$x = \frac{5250}{7}$$

$$x = 750$$

$$x + y = 1100$$

$$750 + y = 1100$$

$$y = 1100 - 750$$

$$y = 350$$

$$\begin{array}{r} x + y = 1100 \quad (-14) \\ \underline{14x + 7y = 12950} \end{array}$$

$$-14x - 14y = -15400$$

$$\underline{14x + 7y = 12950}$$

$$-7y = -2450$$

$$y = \frac{-2450}{-7}$$

$$y = 350$$

$$x + y = 1100$$

$$x + 350 = 1100$$

$$x = 1100 - 350$$

$$x = 750$$

$$x = 750 \quad y = 350$$

$$\begin{array}{r} x + y = 1100 \quad (-1) \\ \underline{14x + 7y = 12950 \quad (\div 7)} \end{array}$$

$$-x - y = -1100$$

$$\underline{2x + y = 1850}$$

$$x = 750$$

$$x + y = 1100$$

$$750 + y = 1100$$

$$y = 1100 - 750$$

$$y = 350$$

II

$$x + y = 1100$$

$$y = 1100 - x$$

$$14x + 7(1100 - x) = 12950$$

$$14x + 7700 - 7x = 12950$$

$$7x = 12950 - 7700$$

$$7x = 5250$$

$$x = 750$$

$$y = 350$$

$$x + y = 1100$$

$$x = 1100 - y$$

$$14(1100 - y) + 7y = 12950$$

$$15400 - 14y + 7y = 12950$$

$$-7y = 12950 - 15400$$

$$-7y = -2450$$

$$7y = 2450$$

$$y = 350$$

$$x = 750$$

Question 4

(a)**15 marks****Att 5****(a)**

$$4x + 3 = 11$$

$$4x = 11 - 3$$

$$4x = -12$$

$$x = -3$$

or

$$11 - 3 = -12$$

$$-12 \div 4 = -3$$

Question 5

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

$$x + y = 40 \quad \text{equation 1}$$

$$5x - 3y = 56 \quad \text{equation 2}$$

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

(ii)

$$x + y = 40 \quad \times 3$$

$$5x - 3y = 56$$

$$3x + 3y = 120$$

$$5x - 3y = 56$$

$$8x = \frac{176}{8} = 22 \quad \text{Correct - merits full marks, not asked for number incorrect}$$

Question 6

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

Week 1

(i)

$$\frac{\text{€}2000}{x}$$

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

Week 2

(ii)

$$\frac{\text{€}2000}{x+1}$$

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

(iii)

$$\frac{2000}{x} - \frac{2000}{x+1} = 100 \quad \text{or equivalent}$$

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

(iv)

$$\frac{2000}{x} - \frac{2000}{x+1} = 100$$

$$2000(x+1) - 2000x = 100(x)(x+1)$$

$$2000x + 2000 - 2000x = 100x^2 + 100x$$

$$100x^2 + 100x - 2000 = 0$$

$$x^2 + x - 20 = 0$$

$$(x+5)(x-4) = 0$$

$$x = -5 \quad \text{or} \quad x = 4$$

Question 7

(a)

5 marks

Att 2

$$\begin{aligned}
 (a) \quad 2x + 2w &= p \\
 2x + 2w &= 24 \\
 2w &= 24 - 2x \\
 w &= 12 - x
 \end{aligned}$$

b(i)

5 marks

Att 2

$$\begin{aligned}
 \text{Inner section length} &= x-2 \\
 \text{Inner section width} &= 12-x-2 \text{ or } 10-x
 \end{aligned}$$

b(ii)

5 marks

Att 2

$$\begin{array}{lcl}
 \text{Area} = xw \text{ (lb)} & \text{or} & \text{Factorises} \\
 = (x-2)(10-x) & & -x^2 + 12x - 20 = (x-2)(-x+10) = lw \\
 = -x^2 + 12x - 20 & &
 \end{array}$$

Question 8

(i)

Method 1

$$(4x-1)(7x+1)$$

Method II

$$\begin{aligned}
 28x^2 - 7x + 4x - 1 \\
 7x(4x-1) + 1(4x-1) \\
 (4x-1)(7x+1)
 \end{aligned}$$

Method III

$$\begin{array}{ccc}
 4x & - & 1 \\
 & \swarrow & \nearrow \\
 & & \\
 & \nwarrow & \searrow \\
 7x & + & 1
 \end{array}$$

$$(4x-1)(7x+1)$$

$$(ii) \quad \text{Solve } \frac{-47x-30}{7} = x^2.$$

b(ii)

$$\begin{aligned}
 \frac{-47x-30}{7} &= x^2 \\
 -47x-30 &= 7x^2 \\
 7x^2 + 47x + 30 &= 0 \\
 (7x+5)(x+6) &= 0 & \text{or Formula} \\
 (7x+5) = 0 & \quad (x+6) = 0 \\
 7x = -5 & \quad x = -6 \\
 x = -\frac{5}{7} &
 \end{aligned}$$

Question 9

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

$$\begin{aligned} & \frac{1}{2x-3} - \frac{1}{x+3} \\ &= \frac{1(x+3) - 1(2x-3)}{(2x-3)(x+3)} \\ &= \frac{x+3-2x+3}{(2x-3)(x+3)} \\ &= \frac{6-x}{(2x-3)(x+3)} \end{aligned}$$

Question 10

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

$$x = \frac{1}{2} = 0.5$$

Method I

$$\frac{3}{x+2} - \frac{1}{2x+4}$$

$$= \frac{3}{\frac{1}{2}+2} - \frac{1}{2(\frac{1}{2})+4}$$

$$= \frac{3}{2\frac{1}{2}} - \frac{1}{1+4}$$

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

$$= 1$$

Method II

$$\frac{3}{0.5+2} - \frac{1}{2(0.5)+4}$$

$$\frac{3}{2.5} - \frac{1}{5}$$

$$1.2 - 0.2$$

$$= 1$$

Method III

$$\frac{5x+10}{(x+2)(2x+4)}$$

$$\frac{5}{(2x+4)} \text{ or Equivalent}$$

$$\frac{5}{2(\frac{1}{2})+4}$$

$$\frac{5}{5}$$

$$= 1$$

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

$$\begin{array}{r} \overline{) 6x^3 - 13x^2 + 27x - 14} \\ \underline{6x^3 - 4x^2} \\ -9x^2 + 27x \\ \underline{-9x^2 + 6x} \\ 21x - 14 \\ \underline{21x - 14} \\ 0 \end{array}$$

Question 11

(b) (ii)

10 marks

Att 3

I					
Brand		gram/pkt	Price/gram		
A	3×100	300	$\frac{135}{300}$	0.45	
B	6×100	600	$\frac{240}{600}$	0.40	<u>B</u> Cheapest
C	4×125	500	$\frac{238}{500}$	0.476	
II					
Brand		Price/bar	Price/gram		
A	$\frac{135}{3}$	45	$\frac{45}{100}$	0.45	
B	$\frac{240}{6}$	40	$\frac{40}{100}$	0.40	<u>B</u> Cheapest
C	$\frac{238}{4}$	59.5	$\frac{59.5}{125}$	0.476	

Question 12

I	II
$\frac{\text{Work hours to build a cabin}}{\text{Hours}} = \frac{8 \times 60}{32} = 15$	$60 : 32 = x : 8$ $\frac{60}{32} = \frac{x}{8}$ $1.875 = \frac{x}{8}$ $x = 15$

Question 13

(a)

10 marks

Att 3

$(2x-3)(4-5x)$ $2x(4-5x) - 3(4-5x)$ $8x - 10x^2 - 12 + 15x$ $-10x^2 + 23x - 12$

Question 14

(c) (i)

10 marks

Att 3

<p>3(c) (i) A swimming pool can be filled by a large pipe operating alone in 4 hours. What fraction of the pool can be filled by this pipe in 1 hour?</p>
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(c) (i)

10 marks


Att 3

<p>Fraction of the pool = $\frac{1}{4}$</p>
--

(c) (ii)

5 marks


Att 2


I
<p>Large pipe delivers $\frac{1}{4}$ of Volume /hour.</p> <p>Small pipe delivers $\frac{1}{x}$ of Volume/ hour.</p> <p>Together they deliver $\frac{1}{4} + \frac{1}{x}$ of Volume /hour</p>
II
<p>L.C.M of 4 and x is $4x$.</p> <p>In $4x$ hours the Large Pipe will fill the pool x times</p> <p>In $4x$ hours the Small Pipe will fill the pool 4 times</p> <p>In $4x$ hours Both Pipes will fill the pool $x+4$ times</p> <p>In 1 hour Both Pipes will fill $\frac{x+4}{4x}$ of the pool.</p>

(c) (iii)

5 marks

Att 2

		
I	II	III
$3\left(\frac{1}{4} + \frac{1}{x}\right) = 1$ $\Rightarrow \frac{3}{4} + \frac{3}{x} = 1$ $\Rightarrow \frac{3}{x} = \frac{1}{4}$ $\Rightarrow x = 12$	$\frac{1}{4} + \frac{1}{x} = \frac{1}{3}$ $\Rightarrow \frac{x+4}{4x} = \frac{1}{3}$ $\Rightarrow 3x + 12 = 4x$ $\Rightarrow x = 12$	<p>3 hours large pipe $\rightarrow \frac{3}{4}$ of pool</p> <p>3 hours small pipe $\rightarrow \frac{1}{4}$ of pool</p> <p>$\Rightarrow \frac{1}{4}$ pool in 3 hours</p> <p>\Rightarrow 1 pool in 12 hours</p>

Question 15

(c) (i)

10 marks


Att 3

$(x+1)^2 + (x+2)^2 = (2x+2)^2$

(c) (ii)

10(5,5) marks

Att (2,2)

			
5 marks	Att 2	5 marks	Att 2
Establishing quadratic equation		Solving quadratic equation	
$(2x+2)^2 = (x+1)^2 + (x+2)^2$ $4x^2 + 8x + 4 = x^2 + 2x + 1 + x^2 + 4x + 4$ $2x^2 + 2x - 1 = 0$		$\frac{-(2) \pm \sqrt{(2)^2 - 4(2)(-1)}}{2(2)}$ $\frac{-(2) \pm \sqrt{4+8}}{4} = \frac{-(2) \pm \sqrt{12}}{4} = \frac{-2 \pm 3 \cdot 464101615}{4}$ $= \frac{-2 + 3 \cdot 464101615}{4} \text{ and } \frac{-2 - 3 \cdot 464101615}{4}$ $= \frac{1 \cdot 464101615}{4} \text{ and } \frac{-5 \cdot 464101615}{4}$ $= 0.3660254038 \text{ and } -1.366025404$ $= \underline{0.37} \quad \text{and} \quad \underline{-1.37}$	

Question 16

(b) (i)

10 marks


Att 3

$3x - y + 2$ $3(2t - 1) - \left(\frac{2}{3}t + 2\right) + 2$ $6t - 3 - \frac{2}{3}t - 2 + 2$ $\frac{16}{3}t - 3 \text{ or } 5\frac{1}{3}t - 3 \text{ or } \frac{16t - 9}{3}$
--

(b) (ii)

10 marks

Att 3

	
$3x - y + 2 = 0$ $\frac{16}{3}t - 3 = 0$ $16t - 9 = 0$ $t = \frac{9}{16} (0.5625)$	

Question 17

(b) (i)

5 marks

Att 2

$(5x - 6y) (5x + 6y)$

Part (b) (ii)**5 marks****Att 2**

$11x^2 + 75x - 14$ $11x^2 + 77x - 2x - 14$ $11x(x + 7) - 2(x + 7)$ $(x + 7)(11x - 2)$		$\frac{-(75) \pm \sqrt{(75)^2 - 4(11)(-14)}}{2(11)}$ $\frac{-75 \pm \sqrt{5625 + 616}}{22} = \frac{-75 \pm 79}{22}$ $\frac{4}{22} = \frac{2}{11} \quad \text{and} \quad \frac{-154}{22} = -7$ $\Rightarrow (11x - 2)(x + 7)$
$\Rightarrow (x + 7)(11x - 2)$		

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

I	II
$(3 - 4x)^2 - (3 - 5x)^2$	$(3 - 4x)^2 - (3 - 5x)^2$
$9 - 24x + 16x^2 - (9 - 30x + 25x^2)$	$[(3 - 4x) - (3 - 5x)][(3 - 4x) + (3 - 5x)]$
$9 - 24x + 16x^2 - 9 + 30x - 25x^2$	$(3 - 4x - 3 + 5x)(3 - 4x + 3 - 5x)$
$6x - 9x^2$	$(x)(6 - 9x)$

Question 18


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

$\frac{x+7}{5} + \frac{3-x}{4}$ $\frac{4(x+7) + 5(3-x)}{20}$ $\frac{4x + 28 + 15 - 5x}{20}$ $\frac{43 - x}{20}$

(c) (i)

15 marks


Att 5

	
I	II
$\frac{6}{x} + \frac{6}{x+2} = \frac{5}{2}$ $\frac{6(x+2)+6(x)}{x(x+2)} = \frac{5}{2}$ $\frac{6x+12+6x}{x^2+2x} = \frac{5}{2}$ $\frac{12x+12}{x^2+2x} = \frac{5}{2}$ $5x^2+10x = 24x+24$ $5x^2-14x-24 = 0$ $(5x+6)(x-4) = 0$ $5x+6 = 0 \text{ and } x-4 = 0$ $\Rightarrow x = -\frac{6}{5} \text{ and } x = 4$	$\frac{6}{x} + \frac{6}{x+2} = \frac{5}{2}$ $\frac{6(x+2)(2)+6(x)(2)-5(x)(x+2)}{x(x+2)(2)} = 0$ $\frac{12x+24+12x-5x^2-10x}{x(x+2)(2)} = 0$ $5x^2-14x-24 = 0$ $(5x+6)(x-4) = 0$ $5x+6 = 0 \text{ and } x-4 = 0$ $\Rightarrow x = -\frac{6}{5} \text{ and } x = 4$

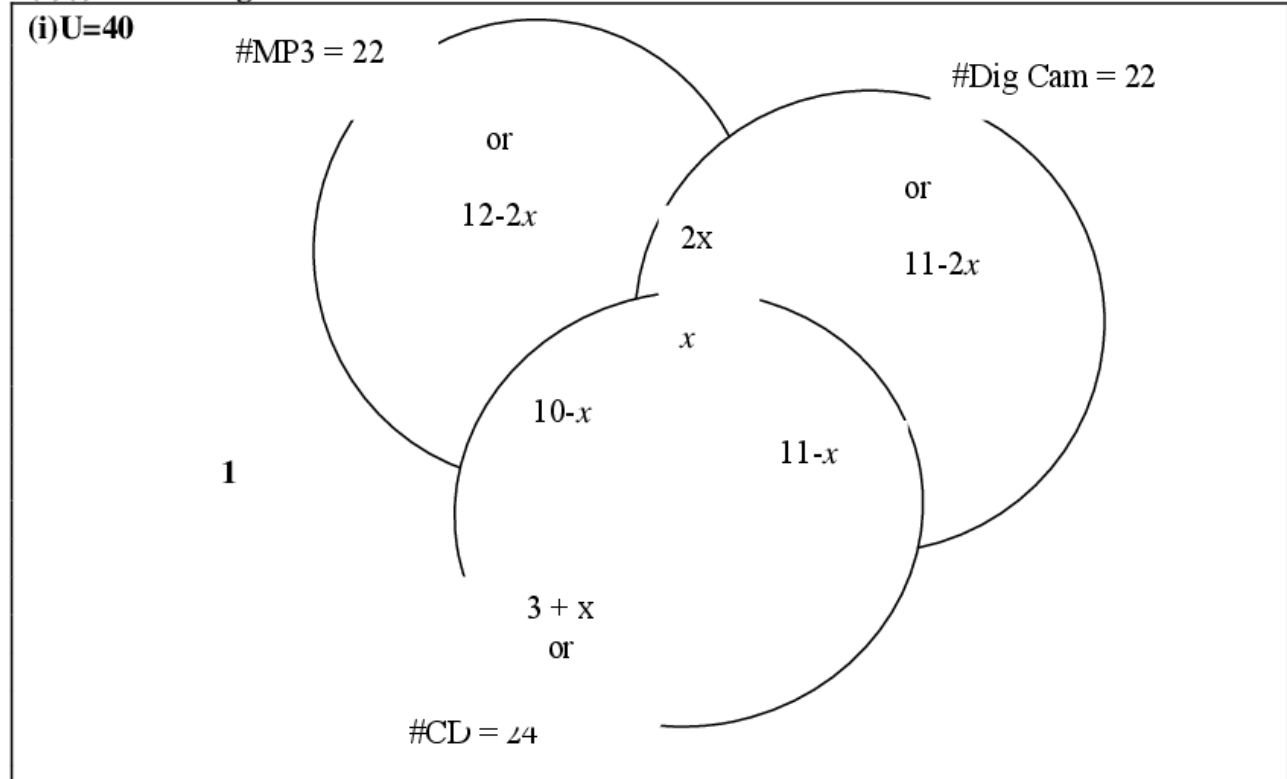
(c) (ii)

5 marks

Att 2

		
I	II	III
$x = 2t - 1$ $-\frac{6}{5} = 2t - 1$ $10t - 5 = -6$ $10t = -1$ $\text{Let } t = -\frac{1}{10}$ and $4 = 2t - 1$ $2t = 5$ $t = \frac{5}{2}$	$\text{Let } x+2 = 2t+1$ $\text{Let } x+2 = 2t+1$ $\Rightarrow x = 2t - 1$ $-\frac{6}{5} = 2t - 1$ $10t - 5 = -6$ $10t = -1$ $t = -\frac{1}{10}$ and $4 = 2t - 1$ $2t = 5$ $t = \frac{5}{2}$	$\frac{6}{2t-1} + \frac{6}{2t+1} = \frac{5}{2}$ $\frac{6(2t+1)(2)+6(2t-1)(2)-5(2t-1)(2t+1)}{2(2t-1)(2t+1)} = 0$ $24t+12+24t-12-20t^2+5=0$ $20t^2-48t-5=0$ $(10t+1)(2t-5)=0$ $10t=-1 \Rightarrow t = -\frac{1}{10} \quad \text{and} \quad 2t=5 \Rightarrow t = \frac{5}{2}$

Question 20

(c)(i) Venn Diagram**10 marks****Att 3****c(i) Finding x****5 marks****Att 2****Finding x**

(i) $1 + 24 + 12 - 2x + 2x + 11 - 2x = 40$
 $48 - 2x = 40$
 $2x = 8$
 $x = 4$

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

(ii) $12 - 2x + 11 - 2x + x + 3 = 26 - 3x$ or $12 - 2x = 12 - 8 = 4$
 $x = 4$ $11 - 2x = 11 - 8 = 3$
 $26 - 12 = 14$ $x + 3 = 7$
 $4 + 3 + 7 = 14$

% $\frac{14}{40} \times 100 = 35\%$

Question 21

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

(ii)

$$\begin{aligned} & (7x - 2)(7x + 2) - (5y - 2)(5y + 2) \\ &= 49x^2 - 4 - [25y^2 - 4] \\ &= 49x^2 - 4 - 25y^2 + 4 \\ &= 49x^2 - 25y^2 \\ &= (7x - 5y)(7x + 5y) \end{aligned}$$

c (i)

5 marks

Att 2

(i) ✍ Solve the equation $3a^2 + 5a = 2$.

(i)

$$3a^2 + 5a = 2$$

$$3a^2 + 5a - 2 = 0$$

$$(3a-1)(a+2) = 0$$

$$3a-1=0 \text{ or } a+2=0$$

$$a = \frac{1}{3} \text{ or } a = -2$$

$$3a^2 + 5a = 2$$

$$3a^2 + 5a - 2 = 0$$

Factorising by Guide Number

$$3a^2 + 5a - 2 \quad \text{GN} = -6$$

$$3a^2 - a + 6a - 2$$

$$a(3a-1) + 2(3a-1)$$

$$(3a-1)(a+2)$$

$$(3a-1)(a+2) = 0 \text{ as before}$$

c(ii)

5 marks

Att 2

(ii)

Method I

Method II

$$3\left(\frac{1}{t}\right)^2 + 5\left(\frac{1}{t}\right) = 2.$$

From c(i)

$$\frac{1}{t} \equiv a$$

$$\frac{1}{t} = \frac{1}{3}$$

$$t = 3$$

or
$$\frac{1}{t} = -2$$

or
$$t = -\frac{1}{2}$$

$$3\left(\frac{1}{t}\right)^2 + 5\left(\frac{1}{t}\right) = 2.$$

$$\frac{3}{t^2} + \frac{5}{t} - 2 = 0 \quad \times t^2$$

$$3 + 5t - 2t^2 = 0$$

$$2t^2 - 5t - 3 = 0$$

$$(2t+1)(t-3) = 0$$

$$t = -\frac{1}{2} \text{ or } t = 3$$

c(iii)

5 marks

Att 2

(iii)

$$3\left(\frac{1}{t}\right)^2 + 5\left(\frac{1}{t}\right) = 2.$$

$$t = 3$$

$$3\left(\frac{1}{3}\right)^2 + 5\left(\frac{1}{3}\right) = 2$$

$$2 = 2$$

$$t = -\frac{1}{2}$$

$$3\left(\frac{1}{-\frac{1}{2}}\right)^2 + 5\left(\frac{1}{-\frac{1}{2}}\right) = 2$$

$$2 = 2$$

Question 24

(b) (i)

5 marks

Att 2

$$(i) \quad I \quad \frac{2x^2 + 4x - 30}{x-3} = \frac{2(x^2 + 2x - 15)}{x-3} \text{ or } \frac{2(x+5)(x-3)}{x-3} \text{ or } 2(x+5)$$

$$II \quad \frac{2x^2 + 4x - 30}{x-3} = \frac{(2x+10)(x-3)}{x-3} \text{ or } 2x+10$$

$$III \quad \begin{array}{r} 2x+10 \\ x-3 \overline{) 2x^2 + 4x - 30} \\ \underline{2x^2 - 6x} \\ +10x - 30 \\ \underline{10x - 30} \\ 0 \end{array}$$

Question 25

(a)

15 marks

Att 5

$$I \quad \begin{aligned} & \frac{3}{x+1} + \frac{4}{x+5} \\ &= \frac{3}{\frac{1}{3}+1} + \frac{4}{\frac{1}{3}+5} \\ &= \frac{3}{\frac{4}{3}} + \frac{4}{\frac{16}{3}} \\ &= \frac{9}{4} + \frac{12}{16} \\ &= \frac{48}{16} \\ &= 3 \end{aligned}$$

$$II \quad \begin{aligned} & \frac{3}{x+1} + \frac{4}{x+5} \\ & \frac{1}{3} = 0.333 = 0.3 \\ & \frac{3}{0.333+1} + \frac{4}{0.333+5} \\ &= \frac{3}{1.333} + \frac{4}{5.333} \\ &= 2.250 + 0.7500 \\ &= 3.00 \end{aligned}$$

$$III \quad \begin{aligned} & \frac{3}{x+1} + \frac{4}{x+5} \\ &= \frac{3(x+5) + 4(x+1)}{(x+1)(x+5)} \\ &= \frac{7x+19}{(x+1)(x+5)} \\ &= \frac{7(\frac{1}{3})+19}{(\frac{1}{3}+1)(\frac{1}{3}+5)} \\ &= \frac{\frac{64}{3}}{\frac{64}{9}} \\ &= \frac{9}{3} \\ &= 3 \end{aligned}$$

Question 26

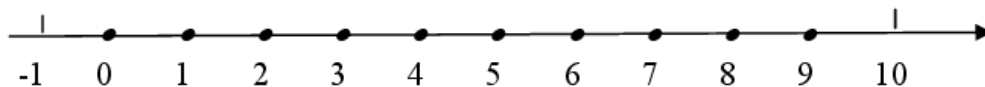
(a)

5 marks

Att 2

$$\begin{aligned} -98 &\leq 10-12x \\ -98-10 &\leq -12x \\ -108 &\leq -12x \\ 9 &\geq x \end{aligned}$$

$$\begin{aligned} -98 &\leq 10-12x \\ 12x &\leq 10+98 \\ x &\leq 9 \end{aligned}$$



Question 27

(c)(ii)

5 marks

Att 2

(ii)

$$\begin{aligned}
 (\sqrt{6} - 2\sqrt{3})(5\sqrt{3} - 3\sqrt{6}) &= \sqrt{6}(5\sqrt{3} - 3\sqrt{6}) - 2\sqrt{3}(5\sqrt{3} - 3\sqrt{6}) \\
 &= 5\sqrt{18} - 3\sqrt{36} - 10\sqrt{9} + 6\sqrt{18} \\
 &= 5 \cdot 3\sqrt{2} - 18 - 30 + 6 \cdot 3\sqrt{2} \\
 &= 15\sqrt{2} - 48 + 18\sqrt{2} \\
 &= 33\sqrt{2} - 48 \text{ or } -48 + 33\sqrt{2}
 \end{aligned}$$

Question 28

b(i)

10 marks

Att 3

(i)

$$\frac{10}{7} = 1.428571 \quad \sqrt{2} = 1.41421 \quad \frac{7}{2\sqrt{6}} = \frac{7\sqrt{6}}{12} = 1.42886 \quad (1.19)^2 = 1.4161$$

$$\sqrt{2}, \quad (1.19)^2, \quad \frac{10}{7}, \quad \frac{7}{2\sqrt{6}}$$

b

b

b

b

$$(1.41421)$$

$$(1.4161)$$

$$(1.428571)$$

$$(1.42886)$$

A

B

C

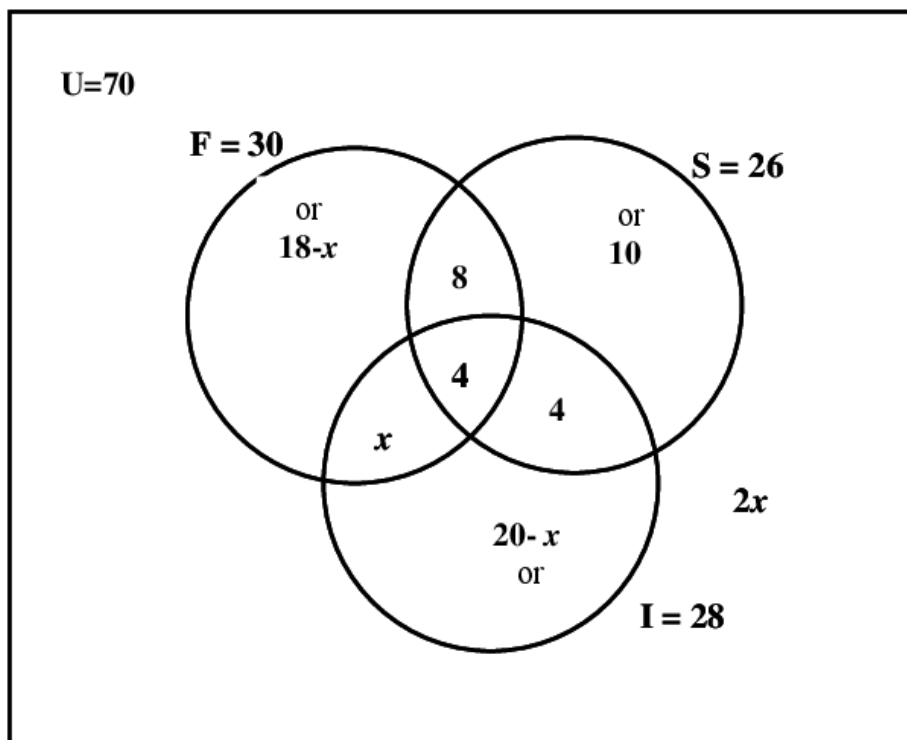
D

Question 29

Part (b) (i)

10 marks

Att 3



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

$$26 + (18 - x) + x + (20 - x) + 2x = 70 \text{ or equivalent}$$

$$64 + x = 70$$

$$x = 70 - 64$$

$$x = 6$$

Number who travelled to, France only $18 - 6 = 12$

Question 30

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

$$(i) \quad \frac{540}{x}$$

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

$$(ii) \quad \frac{300}{x+1} \quad \text{or} \quad 90 - \frac{540}{x}$$

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

$$(iii) \quad \frac{540}{x} + \frac{300}{x+1} = 90 \quad \text{or equivalent}$$

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

$$\frac{540}{x} + \frac{300}{x+1} = 90$$

$$540(x+1) + 300x = 90(x^2 + x)$$

$$540 + 540x + 300x = 90x^2 + 90x$$

$$90x^2 - 750x - 540 = 0$$

$$3x^2 - 25x - 18 = 0$$

$$(3x+2)(x-9) = 0$$

$$x = 9$$

$$\frac{540}{9} = 60$$

Number of days = 60

Question 31

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

(a)	Sunday	=	x°
	Monday	=	$x^{\circ} + 3^{\circ}$
	Tuesday	=	$x^{\circ} + 3^{\circ} + 3^{\circ} = x^{\circ} + 6^{\circ}$
	Wednesday	=	$x^{\circ} + 6^{\circ} - 4^{\circ} = x^{\circ} + 2^{\circ}$
	Thursday	=	$x^{\circ} + 2^{\circ} - 4^{\circ} = x^{\circ} - 2^{\circ}$
	Friday	=	$x^{\circ} - 2^{\circ} - 4^{\circ} = x^{\circ} - 6^{\circ}$
	or		
	$x^{\circ} + 2(3^{\circ}) - 3(4^{\circ}) = x^{\circ} + 6^{\circ} - 12^{\circ} = x^{\circ} - 6^{\circ}$		

Question 32

Part (b)(ii) **5 marks** **Att 2**

(ii)	$9x^2 - 16y^2 = (3x - 4y)(3x + 4y)$
------	-------------------------------------

Question 33

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

(i)	$2l - kl + km - 2m = l(2-k) - m(2-k) = (l - m)(2 - k)$
	$2l - kl + km - 2m = 2l - 2m + km - kl = 2(l - m) - k(l - m) = (2 - k)(l - m)$

Part (b)(ii) **5 marks** **Att 2**

<p>(ii) Round Brackets: $6x^2 - 19x + 10$ $= (3x - 2)(2x - 5)$</p>	<p>Big X $6x^2 - 19x + 10$ $\begin{array}{cc} 3x & -2 \\ & \times \\ 2x & -5 \end{array}$ $= (3x - 2)(2x - 5)$</p>	<p>Guide Number $6x^2 - 19x + 10$ GN = +60 $= 6x^2 - 15x - 4x + 10$ $= 3x(2x - 5) - 2(2x - 5)$ $= (2x - 5)(3x - 2)$</p>
--	--	--

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

(iii)	$17x - 5x^2 = x(17 - 5x)$
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Question 34

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

(i)	$\frac{1}{(2x-3)} - \frac{1}{(2x+3)} = \frac{1(2x+3) - 1(2x-3)}{(2x-3)(2x+3)} = \frac{2x+3-2x+3}{(2x-3)(2x+3)} = \frac{6}{(2x-3)(2x+3)}$
-----	--

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

$$\frac{6}{(2x-3)(2x+3)} = \frac{6}{7}$$

$$\frac{6}{4x^2-9} = \frac{6}{7}$$

$$24x^2 - 54 = 42$$

$$24x^2 = 96$$

$$x^2 = 4 \quad \text{or} \quad x^2 - 4 = 0 \quad \text{or} \quad \text{Formula}$$

$$x = \pm 2 \quad (x-2)(x+2) = 0$$

$$x = 2 \quad \text{or} \quad x = -2$$

Question 35

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

$$x^2 - 4x - 8 = 0$$

$$a = 1 \quad b = -4 \quad c = -8$$

$$(i) \quad \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot -8}}{2 \cdot 1} = \frac{4 \pm \sqrt{16 + 32}}{2} = \frac{4 \pm \sqrt{48}}{2}$$

$$= \frac{4 \pm 4\sqrt{3}}{2} = 2 \pm 2\sqrt{3}$$

Question 36

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

$$(ii) \quad \$4620 = \left(\frac{4620}{1.32} \right)$$

$$= \text{€}3500$$

$$\text{Profit made} = \text{€}3500 - \text{€}2985$$

$$= \text{€}515$$

Question 37

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

$$(ii) \quad \frac{3 \cdot 6}{x+30}$$

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

$$(iii) \quad \frac{3.6}{x} - \frac{3.6}{x+30} = 0.01 \text{ or equivalent.}$$

(c) (iv)

5 marks

Att 2

$$(iv) \quad \frac{3.6}{x} - \frac{3.6}{x+30} = 0.01$$

$$\frac{3.6(x+30) - 3.6(x)}{(x)(x+30)} = 0.01$$

$$3.6x + 108 - 3.6x = 0.01(x)(x+30)$$

$$0.01x^2 + 0.3x - 108 = 0$$

$$x^2 + 30x - 10800 = 0$$

$$(x-90)(x+120) = 0 \quad x = 90. \quad \text{Grams during promotion} = 120.$$

Question 38

(a)

10 marks

Att 3

x = cost of a shirt
 $4x$ = cost of sweater

or

x = cost of shirt
 y = cost of sweater

$$7x + 2y = \text{€}202.50 \quad 4x = y \Rightarrow 4x - y = 0$$

$$7x + 2(4x) = \text{€}202.50$$

$$7x + 8x = \text{€}202.50$$

$$15x = \text{€}202.50$$

$$x = \text{€}13.50$$

$$7x + 2y = \text{€}202.50$$

$$8x - 2y = 0$$

$$15x = \text{€}202.50$$

$$x = \text{€}13.50$$

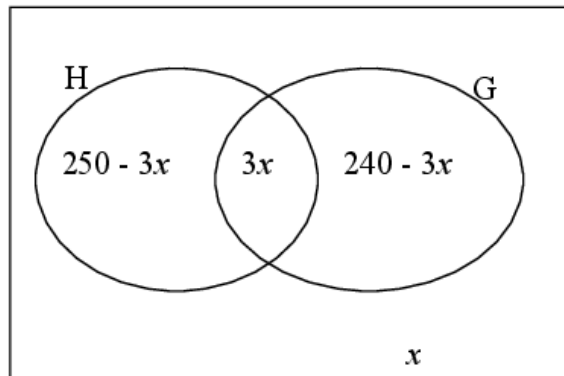
Question 39

(b) (i)

5 marks

Att 2

(i)



(b) (ii)

10 marks

Att 3

$$(ii) \quad \begin{aligned} & 250 - 3x + 3x + 240 - 3x + x \\ &= 250 + 240 - 3x + x \\ &= 490 - 2x \end{aligned}$$

(b) (iii)

5 marks

Att 2

$$\begin{aligned}
 \text{(iii)} \quad & 490 - 2x = 430 \\
 & - 2x = - 60 \\
 & x = 30
 \end{aligned}$$

Question 40

(b) (i)

10 marks

Att 3

(i) *Round Brackets:*

or

Big 'X':

$$\begin{array}{r}
 3x \quad -1 \\
 \quad \quad \quad \times \\
 x \quad \quad \quad +3
 \end{array}$$

$$(3x - 1)(x + 3)$$

$$\begin{array}{l}
 \rightarrow \\
 (3x - 1)(x + 3)
 \end{array}$$

Check

(i) $3x^2$ term

(ii) - 3 term

(iii) middle term

(b) (ii)

5 marks

Att 2

$$\begin{aligned}
 \text{(ii)} \quad & 3p - c + 3pc - c^2 \\
 & = 1(3p - c) + c(3p - c) \\
 & = (3p - c)(1 + c)
 \end{aligned}$$

(b) (iii)

5 marks

Att 2

$$\begin{aligned}
 \text{(iii)} \quad & (2x - 1)^2 - (x - 1)^2 \\
 & = [(2x - 1) - (x - 1)] [(2x - 1) + (x - 1)] \quad \text{or} \quad (2x - 1)(2x - 1) - (x - 1)(x - 1) \\
 & = (2x - 1 - x + 1)(2x - 1 + x - 1) \quad = (4x^2 - 4x + 1) - (x^2 - 2x + 1) \\
 & = (x)(3x - 2) \quad = 4x^2 - 4x + 1 - x^2 + 2x - 1 \\
 & = 3x^2 - 2x \quad = 3x^2 - 2x
 \end{aligned}$$

Question 41

(c) (i)

15 marks

Att 5

$$\text{(i)} \quad \frac{1(x+1)+1(x-1)}{(x-1)(x+1)} = \frac{x+1+x-1}{(x-1)(x+1)} = \frac{2x}{(x-1)(x+1)}$$

(c) (ii)

5 marks

Att 2

$$\begin{aligned}
 \text{(ii)} \quad & \frac{2x}{(x-1)(x+1)} = 3 \\
 & 2x = 3(x-1)(x+1) \\
 & 2x = 3x^2 - 3 \\
 & 3x^2 - 2x - 3 = 0 \\
 & x = \frac{2 \pm \sqrt{4+36}}{6} = \frac{2 \pm \sqrt{40}}{6} \\
 & x = \frac{2 \pm 2\sqrt{10}}{6} \\
 & x = \frac{1}{3} \pm \frac{1}{3}\sqrt{10}
 \end{aligned}$$

Question 42

(a)

10 marks

Att 3

$$\begin{aligned}
 f(-3) &= (-3)^2 + (-3) - 7 \\
 &= 9 - 3 - 7 \\
 &= -1
 \end{aligned}$$

Question 43

(c) (i)

10 marks

Att 3

I

$$€2030 - €2000 = €30$$

$$€30 = 75\%$$

$$\frac{30}{75} = 0.4 = 1\%$$

$$0.4 \times 100 = €40 = \text{Interest}$$

$$\frac{40}{2000} \times \frac{100}{1}$$

$$\text{Rate of interest } r = 2\%$$

II

$$€2000 \times \frac{r}{100} = 20r$$

$$20r \times \frac{25}{100} = \frac{500r}{100} = 5r$$

$$20r - 5r = 15r$$

$$(\text{or } 20r \times \frac{75}{100} = 15r)$$

$$15r = 30$$

$$r = 2\%$$

(c) (ii)

10 marks

Att 3

$$€2030 \times \frac{2}{100} = €40.60$$

$$€40.60 \times \frac{25}{100} = €10.15$$

$$€40.60 - €10.15 = €30.45$$

$$€2030 + €30.45 = €2060.45$$

Interest

Tax on interest

Interest less tax (or €40.60 × $\frac{75}{100}$ = €30.45)

Value of the investment

(b) (i)

15(10, 5) marks

Att(3, 2)

$$\begin{aligned} 14x + 10y &= 555 \\ 12x + 5y &= 390 \end{aligned}$$

(b) (ii)

10 marks

Att 3

I

$$\begin{aligned} 14x + 10y &= 555 \\ 12x + 5y &= 390 \end{aligned} \quad (-2) \quad \mathbf{3\ m}$$

$$\begin{aligned} 14x + 10y &= 555 \\ -24x - 10y &= -780 \\ -10x &= -225 \\ x &= \text{€}22.50 \end{aligned} \quad \begin{array}{l} \mathbf{4m} \\ \mathbf{7\ m} \end{array}$$

$$\begin{aligned} 14(22.5) + 10y &= 555 \\ 315 + 10y &= 555 \\ 10y &= 240 \\ y &= \text{€}24 \end{aligned} \quad \mathbf{10\ m}$$

II

$$\begin{aligned} 14x + 10y &= 555 \quad \times 6 \\ 12x + 5y &= 390 \quad \times -7 \end{aligned} \quad \mathbf{3m}$$

$$\begin{aligned} 86x + 60y &= 3330 \\ -84x - 35y &= -2730 \end{aligned}$$

$$\begin{aligned} 25y &= 600 \\ y &= \text{€}24.00 \end{aligned} \quad \begin{array}{l} \mathbf{4m} \\ \mathbf{7m} \end{array}$$

$$\begin{aligned} 14x + 10(24) &= 555 \\ 14x + 240 &= 555 \end{aligned}$$

$$\begin{aligned} 14x &= 315 \\ x &= \text{€}22.50 \end{aligned} \quad \mathbf{10m}$$

III

$$\begin{aligned} 14x + 10y &= 555 \\ 12x + 5y &= 390 \end{aligned}$$

$$14x = 555 - 10y \quad \mathbf{3m}$$

$$x = \frac{555 - 10y}{14}$$

$$12\left(\frac{555 - 10y}{14}\right) + 5y = 390 \quad (\times 14)$$

$$\begin{aligned} 6660 - 120y + 70y &= 5460 \\ -50y &= -1200 \end{aligned} \quad \mathbf{4m}$$

$$y = \text{€}24.00 \quad \mathbf{7m}$$

$$x = \frac{555 - 10(24)}{14}$$

$$x = \text{€}22.50 \quad \mathbf{10m}$$

IV

$$\begin{aligned} 14x + 10y &= 555 \\ 12x + 5y &= 390 \end{aligned}$$

$$5y = 390 - 12x \quad \mathbf{3m}$$

$$y = \frac{390 - 12x}{5}$$

$$14x + 10\left(\frac{390 - 12x}{5}\right) = 555 \quad (\times 5)$$

$$\begin{aligned} 70x + 3900 - 120x &= 2775 \\ -50x &= -1125 \end{aligned} \quad \mathbf{4m}$$

$$x = \text{€}22.50 \quad \mathbf{7m}$$

$$y = \frac{390 - 12(22.5)}{5}$$

$$y = \text{€}24.00 \quad \mathbf{10m}$$

Question 45

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

$$\frac{300}{x+1}$$

(c) (ii)

5 marks

Att 2

$$\frac{300}{x} - \frac{300}{x+1} = 10 \quad (\text{or equivalent, based on (c) (i)})$$

(c) (iii)

(5, 5) marks

Att 2,2

$$\frac{300(x+1) - 300x}{(x)(x+1)} = 10$$

$$\frac{300x + 300 - 300x}{(x)(x+1)} = 10$$

$$\frac{300}{(x)(x+1)} = 10$$

$$300 = 10(x)(x+1)$$

$$300 = 10(x^2 + x) \quad \text{2m}$$

$$30 = x^2 + x \quad \text{or} \quad x^2 + x - 30 = 0 \quad \text{or} \quad 300 = 10x^2 + 10x \quad \text{5m}$$

$$x^2 + x - 30 = 0$$

$$(x + 6)(x - 5) = 0$$

$$x = -6, x = 5 \quad \text{4m}$$

$$\text{Solution: } x = 5. \quad \text{5m}$$

Question 46

(c) (i)

5 marks

Att 2

$$\frac{3}{x+1} - \frac{2}{x+4}$$

$$\frac{3(x+4) - 2(x+1)}{(x+1)(x+4)}$$

$$\frac{3x + 12 - 2x - 2}{(x+1)(x+4)}$$

$$\frac{x + 10}{(x+1)(x+4)}$$

$$\frac{x + 10}{x^2 + 5x + 4}$$

(c) (ii)

10(5, 5) marks

Att(2, 2)

5 marks	Att2	5 marks	Att2
Establishing quadratic equation		Solving quadratic equation	
<p>I</p> $\frac{x + 10}{x^2 + 5x + 4} = \frac{1}{3}$ $3(x+10) = 1(x+1)(x+4)$ $3x + 30 = x^2 + x + 4x + 4$ $x^2 + 2x - 26 = 0 \quad \mathbf{5m}$		<p>$a = 1; b = 2; c = -26$</p> $x = \frac{-2 \pm \sqrt{(2)^2 - 4(1)(-26)}}{2(1)}$ $x = \frac{-2 \pm \sqrt{4 + 104}}{2}$ $x = \frac{-2 \pm \sqrt{108}}{2}$ $x = \frac{-2 \pm 6\sqrt{3}}{2}$ <p>$-1 \pm 3\sqrt{3} \quad \text{or} \quad 1 \pm 3\sqrt{3} \quad (\text{see } *)$</p> <p style="text-align: right;">5m</p>	
<p>II</p> $\frac{3}{x + 1} - \frac{2}{x + 4} = \frac{1}{3}$ $3(3)(x + 4) - 2(3)(x + 1) = (x + 1)(x + 4)$ $9x + 36 - 6x - 6 = x^2 + x + 4x + 4$ $x^2 + 2x - 26 = 0 \quad \mathbf{5m}$			

Question 47

(c) (i)

5 marks

Att 2

<p>I $-x^2 - 4x + 5 = 0$ $(-x - 5)(x - 1) = 0$ $-x = 5 \quad x - 1 = 0$ $x = -5 \quad x = 1$ Cuts the x-axis at $(-5, 0)$ and $(1, 0)$.</p> <p>II $-x^2 - 4x + 5 = 0$ $a = -1, b = -4, c = 5$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(-1)(5)}}{2(-1)} = \frac{4 \pm \sqrt{36}}{-2} = \frac{4 \pm 6}{-2} = -5 \quad \text{and} \quad 1$</p> <p>Cuts the x-axis at $(-5, 0)$ and $(1, 0)$</p>

(c) (ii)

15 marks

Att 5

$$f(x) = -x^2 - 4x + 5$$

$$f(x+1) = -(x+1)^2 - 4(x+1) + 5$$

$$= -(x^2 + 2x + 1) - 4x - 4 + 5$$

$$= -x^2 - 2x - 1 - 4x + 1$$

$$= -x^2 - 6x$$

$$f(x) = f(x+1)$$

$$-x^2 - 4x + 5 = -x^2 - 6x$$

$$-x^2 - 4x + 5 + x^2 + 6x = 0$$

$$2x + 5 = 0$$

$$2x = -5$$

$$x = -\frac{5}{2}$$

Question 48

(b) (i)

5 marks

Att 2

$$x^2 - 1 = \text{Given}$$

$$x^2 - 1^2 = \text{2m}$$

$$(x-1)(x+1) = \text{5m}$$

(b) (ii)

10 marks

Att 3

I

$$ax - 3 - a + 3x = \text{Given}$$

$$ax - a + 3x - 3 = \text{3m}$$

$$a(x-1) + 3(x-1) = \text{7m}$$

$$(a+3)(x-1) = \text{10m}$$

II

$$ax - 3 - a + 3x = \text{Given}$$

$$ax + 3x - a - 3 = \text{3m}$$

$$x(a+3) - 1(a+3) = \text{7m}$$

$$(a+3)(x-1) = \text{10m}$$

(b) (iii)

5 marks

Att 2

I

$$6x^2 + x - 35$$

$$(2x+5)(3x-7)$$

II

$$6x^2 + x - 35$$

$$6x^2 - 14x + 15x - 35$$

$$2x(3x-7) + 5(3x-7)$$

$$(2x+5)(3x-7)$$

III

$$6x^2 + x - 35$$

$$6x^2 + 15x - 14x - 35$$

$$3x(2x+5) - 7x(2x+7)$$

$$(2x+5)(3x-7)$$

Question 49

(c) (i)

5 marks

Att 2

$$\frac{200}{x}$$

(c) (ii)

5 marks

Att 2

$$\frac{200}{x-3}$$

(c) (iii)

10 (5,5) marks

Att 2,2

Establish equation

$$\frac{200}{x-3} - \frac{200}{x} = 15 \quad 2\text{m}$$

$$\frac{200x - 200(x-3)}{x(x-3)} = 15x(x-3) \quad 2\text{m}$$

$$200x - 200x + 600 = 15x^2 - 45x \quad 2\text{m}$$

$$600 = 15x^2 - 45x \quad 5\text{m}$$

$$15x^2 - 45x - 600 = 0$$

$$x^2 - 3x - 40 = 0$$

Solve

$$(x-8)(x+5) = 0 \quad 2\text{m}$$

$$\rightarrow 8 \text{ and } -5 \quad 4\text{m}$$

$$\text{Solution: } x = 8 \quad 5\text{m}$$

(b) (i)**10 marks****Att3**

$$\text{I}$$

$$3x^2 + 5x - 28 \div x + 4$$

$$\frac{(3x - 7)(x + 4)}{x + 4}$$

$$= 3x - 7$$

II

$$3x^2 + 5x - 28 \div x + 4$$

$$3x^2 + 12x - 7x - 28 \div x + 4$$

$$3x(x + 4) + 7(x + 4) \div x + 4$$

$$(3x - 7)(x + 4) \div x + 4$$

$$= 3x - 7$$

IIIDivision to give answer $3x - 7$

$$\begin{array}{r}
 3x - 7 \\
 x + 4 \overline{) 3x^2 + 5x - 28} \\
 \underline{3x^2 + 12x} \\
 - 7x - 28 \\
 \underline{- 7x - 28} \\
 0
 \end{array}$$

I

$$\frac{4x+2}{5} - \frac{6-x}{3} = -5$$

$$\frac{3(4x+2) - 5(6-x)}{15} = -5$$

$$3(4x+2) - 5(6-x) = 15(-5)$$

$$12x + 6 - 30 + 5x = -75$$

$$17x - 24 = -75$$

$$17x = -75 + 24$$

$$17x = -51$$

$$x = -51 \div 17$$

$$x = -3$$

II

$$\frac{4x+2}{5} - \frac{6-x}{3} = -5$$

$$\frac{(4x+2)(3)(5) - (6-x)(3)(5)}{5 \cdot 3} = -5(3)(5)$$

$$3(4x+2) - 5(6-x) = 15(-5)$$

$$12x + 6 - 30 + 5x = -75$$

$$17x - 24 = -75$$

$$17x = -75 + 24$$

$$17x = -51$$

$$x = -51 \div 17$$

$$x = -3$$

III

$$\frac{4x+2}{5} - \frac{6-x}{3} = -5$$

$$3(4x+2) - 5(6-x) = (5)(3)(-5)$$

$$12x + 6 - 30 + 5x = -75$$

$$17x - 24 = -75$$

$$17x = -75 + 24$$

$$17x = -51$$

$$x = -51 \div 17$$

$$x = -3$$

(a)

10 marks

Att 3

I

$$\begin{aligned} & \frac{a+5}{3} - \frac{a+4}{2} \\ & \frac{\frac{1}{4}+5}{3} - \frac{\frac{1}{4}+4}{2} \\ & \frac{5\frac{1}{4}}{3} - \frac{4\frac{1}{4}}{2} \\ & 1\frac{3}{4} - 2\frac{1}{8} \\ = & \frac{-3}{8} \end{aligned}$$

II

$$\begin{aligned} & \frac{a+5}{3} - \frac{a+4}{2} \\ & \frac{2(a+5) - 3(a+4)}{6} \\ & \frac{2a+10 - 3a - 12}{6} \\ & \frac{-a-2}{6} \\ & a = \frac{1}{4} \\ & \frac{-\frac{1}{4} - 2}{6} \\ & \frac{-2\frac{1}{4}}{6} \\ & -\frac{3}{8} \end{aligned}$$

(b)(i)

10 marks

Att 3

$$\begin{aligned} & \frac{4(x+2) - 5(x-1)}{(x-1)(x+2)} \\ & \frac{4x+8 - 5x+5}{(x-1)(x+2)} \\ & \frac{-x+13}{(x-1)(x+2)} \end{aligned}$$

(b)(ii)**10 (5,5) marks****Att 2,2**

$$\frac{-x+13}{(x-1)(x+2)} = \frac{3}{2}$$

$$2(-x+13) = 3(x-1)(x+2)$$

$$-2x+26 = (3x-3)(x+2)$$

$$-2x+26 = 3x^2+3x-6$$

$$3x^2+5x-32=0$$

Equation 5m

$$\frac{-5 \pm \sqrt{25-4(3)(-32)}}{2(3)}$$

$$\frac{-5 \pm \sqrt{25+384}}{6}$$

$$\frac{-5 \pm \sqrt{409}}{6}$$

$$\frac{-5 \pm 20.22374842}{6}$$

$$\frac{-25.22374842}{6} \quad \text{and} \quad \frac{15.22374842}{6}$$

$$x = -4.2$$

$$\text{and } x = 2.5$$

Solve 5m

Question 52

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

$$-2x+1 > -7$$

$$-2x > -7-1$$

$$-2x > -8$$

$$2x < 8$$

$$x < 4$$

$$x \in \{1,2,3\}$$

**II**

$$-2x+1 > -7$$

$$1+7 > 2x$$

$$8 > 2x$$

$$4 > x$$

$$x < 4$$

$$x \in \{1,2,3\}$$

