

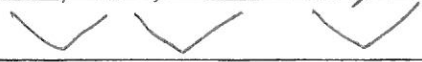


1.2.	$x^2 - 2yxc + 2x = y^2 \dots 1$		1.3.	$\frac{x}{y} + \frac{y}{x} = \frac{25}{12}$	
	$4^x = 2 \cdot 2^y$			LCD = 12xy	
	$(2^2)^x = 2^{1+y}$			( $\therefore x \neq 0 ; y \neq 0$ )	
	$2^{2x} = 2^{1+y} \checkmark$			x thru	
	$2x = 1+y \dots 2$			$12x^2 + 12y^2 = 25xy$	
	(2): $2x-1 = y \checkmark$			$12x^2 - 25xy + 12y^2 = 0 \checkmark$	
	Into (1):			$(3x-4y)(4x-3y) = 0 \checkmark$	
	$x^2 - 2(2x-1)xc + 2x = y^2 \checkmark$			$3x = 4y$ or $4x = 3y$	
	$x^2 - 2(2x^2 - xc) + 2x = (2x-1)^2$			$\frac{x}{y} = \frac{4}{3} \checkmark$ $\checkmark \frac{x}{y} = \frac{3}{4}$	4
	$x^2 - 4x^2 + 2x + 2x = 4x^2 - 4x + 1$				
	$0 = 7x^2 - 8x + 1 \checkmark$		1.4.	$\sqrt{7-x} = x+5$	
	$= (x-1)(7x-1) \checkmark$				
	$\therefore x = 1$ or $\frac{1}{7} \checkmark_{\text{both}}$		1.4.	1. $7-x \geq 0$ and $x+5 \geq 0$	
	$\therefore y = 2(1) - 1$ or $2(\frac{1}{7}) - 1$			$-x \geq -7$ $x \geq -5$	
	$= 1$ $\checkmark_{\text{both}} = -\frac{5}{7}$			$x \leq 7$	
	$\therefore \underline{x=1 \text{ and } y=1}$			$\therefore -5 \leq x \leq 7$	
	or			$a \leq x \leq b$	
	$\underline{xc = \frac{1}{7} \text{ and } y = -\frac{5}{7}} \checkmark$	7		$\therefore a = -5$ $b = 7$	2
				2. $(\sqrt{7-x})^2 = (x+5)^2$	
				$7-x = x^2 + 10x + 25$	
				$0 = x^2 + 11x + 18 \checkmark$	
				$= (x+2)(x+9) \checkmark$	
				$\therefore x = -2$ or $-9$	
				$\checkmark$ $\checkmark$ reject	5

<p>2.1. <math>\frac{m(x^2+x-1)}{3-x} = x</math></p>		<p><math>\therefore 5(m-\frac{1}{5})^2 + \frac{44}{5} &gt; 0</math>  <math>\therefore \Delta &gt; 0</math> ✓ whole argument correct</p>
<p>2.1. 1. LCD = (3-x)  <math>(\therefore x \neq 3)</math>  <math>x \nmid LRU</math>  <math>m(x^2+x-1) = x(3-x)</math></p>		<p><math>\therefore</math> roots always real  <u>and unequal</u> → 5</p>
<p><math>mx^2+mx-m = 3x-x^2</math>  <math>mx^2+x^2+mx-3x-m = 0</math>  <math>x^2(m+1)+x(m-3)-m = 0</math></p>	<p>2.2.</p>	<p><math>x(3x-k) = 10</math>  <math>x = \frac{2}{3}</math></p>
<p><math>\Delta = b^2 - 4ac</math>  <math>\checkmark = (m-3)^2 - 4(m+1)(-m)</math>  <math>= m^2 - 6m + 9 - 4(-m^2 - m)</math>  <math>\checkmark = m^2 - 6m + 9 + 4m^2 + 4m</math>  <math>= 5m^2 - 2m + 9</math></p>	<p>4</p>	<p><math>\checkmark</math>  <math>\therefore \frac{2}{3}(3(\frac{2}{3}) - k) = 10</math>  <math>\frac{2}{3}(2 - k) = 10</math>  <math>2 - k = 15</math>  <math>-13 = k</math> ✓ 2</p>
<p>2. <math>\Delta</math>  <math>= 5m^2 - 2m + 9</math> ✓  <math>\checkmark = 5[m^2 - \frac{2}{5}m + (-\frac{1}{5})^2 - (-\frac{1}{5})^2] + 9</math>  <math>= 5[(m-\frac{1}{5})^2 - \frac{1}{25}] + 9</math>  <math>= 5(m-\frac{1}{5})^2 - \frac{1}{5} + 9</math>  <math>= 5(m-\frac{1}{5})^2 + \frac{44}{5}</math> ✓</p>		
<p>Now, <math>\forall m \in \mathbb{R}</math> :  <math>(m-\frac{1}{5})^2 \geq 0</math>  <math>\therefore 5(m-\frac{1}{5})^2 \geq 0</math>  <math>\therefore 5(m-\frac{1}{5})^2 + \frac{44}{5} \geq \frac{44}{5}</math></p>		

3.1.	1.	$3x^{\frac{1}{2}}(x^{-\frac{1}{2}} - 2\sqrt{x})$ $= 3x^{\frac{1}{2}}(x^{-\frac{1}{2}} - 2x^{\frac{1}{2}})$ $= 3 \cdot x^0 - 6x^1$ $= 3 - 6x$	2
	2.	$\frac{4 - (2 - 3\sqrt{5})^2}{\sqrt{5} + 1}$ $= \frac{4 - (4 - 12\sqrt{5} + 9 \cdot 5)}{\sqrt{5} + 1}$ $= \frac{4 - (49 - 12\sqrt{5})}{\sqrt{5} + 1}$ $= \frac{4 - 49 + 12\sqrt{5}}{\sqrt{5} + 1}$ $= \frac{-45 + 12\sqrt{5}}{\sqrt{5} + 1} \times \frac{\sqrt{5} - 1}{\sqrt{5} - 1}$ $= \frac{-45\sqrt{5} + 45 + 12 \cdot 5 - 12\sqrt{5}}{5 - 1}$ $= \frac{105 - 57\sqrt{5}}{4}$ $= \frac{105}{4} - \frac{57}{4}\sqrt{5}$	4
	3.	$\sqrt[6]{16} \cdot \sqrt[6]{4}$ $= \sqrt[6]{16 \cdot 4}$ $= \sqrt[6]{64}$ $= 2$	2
3.1.	4.	$\sqrt[3]{x^{\frac{2}{3}}}$ $= \sqrt{x^{\frac{2}{9}}} \checkmark$ $= x^{\frac{1}{9}} \checkmark$	2
3.2.	1.	$3^{2x} - 3^{2x-3}$ $= 3^{2x} - 3^{2x} \cdot 3^{-3}$ $= \checkmark 3^{2x} (1 - 3^{-3}) \checkmark$ $= 3^{2x} (1 - \frac{1}{27})$ $= 3^{2x} \cdot \frac{26}{27} \checkmark$	3
	2.	$12x^{\frac{7}{3}} + x^{\frac{5}{3}} - 6x$ $= \checkmark x (12x^{\frac{4}{3}} + x^{\frac{2}{3}} - 6) \checkmark$ $= x (3x^{\frac{2}{3}} - 2)(4x^{\frac{2}{3}} + 3) \checkmark$	3

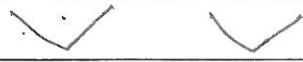
4.1.  $3; x; 3x-8; 4x+1$



$x-3 \quad 3x-8-x \quad 4x+1-(3x-8)$

$= 2x-8 \quad = 4x+1-3x+8$

$= x+9$



$2x-8-(x-3) \quad x+9-(2x-8)$

$= 2x-8-x+3 \quad = x+9-2x+8$

$= x-5 \quad = -x+17$



$x-5 = -x+17$

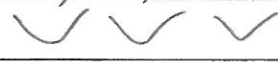
$2x = 22$

$x = 11$



4

4.2. 2.  $2; -1; -4; -7; \dots$



$-3 \quad -3 \quad -3$

$T_n = a + (n-1)d$  d.d f+s

$= 2 + (n-1)(-3)$  ✓ ✓

$= 2 + (-3n+3)$

$= 2 - 3n + 3$

$= 5 - 3n$

$\therefore T_n$

$= (5-3n)(-n^2-3n+6)$  ✓

3

4.2. 1.  $2; -4; -12; -22; \dots$



$-6 \quad -8 \quad -10$



$-2 \quad -2$

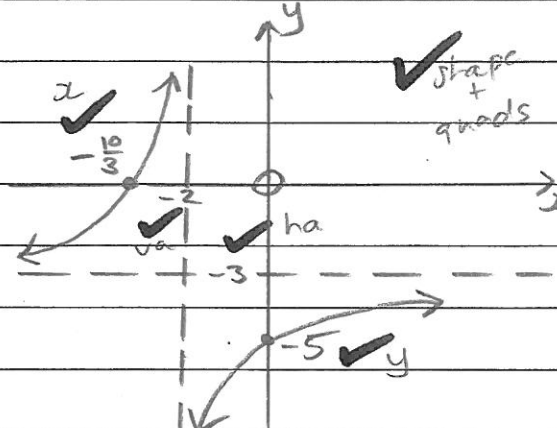
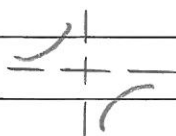
$d_2 = 2a \quad d_1 = 3a+b \quad T_1 = a+b+c$

$-2 = 2a \quad -6 = 3(-1)+b \quad 2 = -1-3+c$

$-1 = a \quad -3 = b \quad 6 = c$

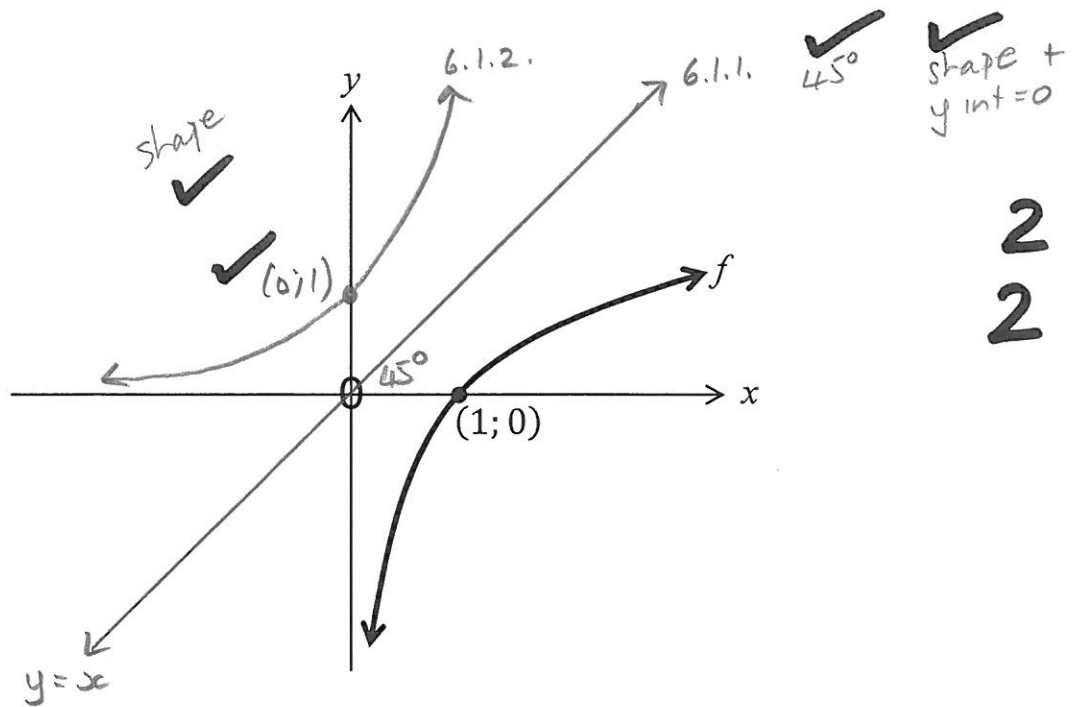
$\therefore T_n = -n^2 - 3n + 6$  ✓

4

5.	$f: y = -\frac{4}{x+2} - 3$ $= \frac{-4}{x+2} - 3$				
5.1.	<u>Hyperbola</u> ✓	1			5
5.2.	<u>y int:</u> $y = \frac{-4}{0+2} - 3$ $= -5$		5.3.	$f(x) = \frac{-4 - 3(x+2)}{x+2}$ ✓	
	<u>x int:</u> $0 = \frac{-4}{x+2} - 3$ $3 = \frac{-4}{x+2}$ $L \cap = (x+2)$ $(\because x \neq -2)$ $x \neq -2$			$= \frac{-4 - 3x - 6}{x+2}$ $= \frac{-3x - 10}{x+2}$ ✓ $= \frac{-(3x+10)}{x+2}$ ✓ cf $= -\frac{3x+10}{x+2}$	3
	$3(x+2) = -4$ $x = -\frac{10}{3} \quad -3,33$		5.4.	$y = -(x+2) - 3$ $= -x - 2 - 3$ $= -x - 5$ ✓	1
	<u>ha:</u> $y = -3$				
	<u>va:</u> $x+2=0$ $\therefore x = -2$		5.5.	$x \rightarrow x-3$ $\therefore f \xrightarrow{3} h$	
	<u>shape:</u> $k = -$ 			$x = -2$ $x = 1$ ✓	1

Name and Surname : Solns

6.1.1. and 6.1.2.



2  
2

6.2.1.	$g: y = -3x^2 + 2$ <p>aw grad</p> $= \frac{\Delta y}{\Delta x}$ $= \frac{-73 - (-46)}{5 - (-4)}$ $= -3 \checkmark$ <p style="text-align: center;">→</p>	$x = -4: y = -3(-4)^2 + 2$ $= -46 \checkmark$ $x = 5: y = -3(5)^2 + 2$ $= -73 \checkmark$ <p style="text-align: right; font-size: 2em;">3</p>
6.2.2.	$g: y = -3x^2 + 2$ $x = -3y^2 + 2 \checkmark$ $3y^2 = -x + 2$ $y^2 = -\frac{1}{3}x + \frac{2}{3} \checkmark$ $y = \pm \sqrt{-\frac{1}{3}x + \frac{2}{3}}$ <p style="text-align: center;">→</p> <p style="text-align: center;">±    √</p>	$\frac{-x+2}{3} \quad \frac{x-2}{-3}$ <p style="text-align: right; font-size: 2em;">4</p>

OK