Question	Answer	Marks	Partial Marks
1	$\frac{\sin\theta}{\cos\theta}+\frac{\cos\theta}{\sin\theta}$	**M1**	
	$\frac{\sin^2\theta+\cos^2\theta}{\cos\theta\sin\theta}$	**A1**	
	$\frac{1}{\cos\theta\sin\theta}$ oe **and** completion to given answer $\sec\theta\,\text{cosec}\,\theta$	**A1**	
	Alternative		
	$\left[\tan\theta+\frac{1}{\tan\theta}=\right] = \frac{\tan^2+1}{\tan\theta}$	**(M1)**	
	$\frac{\sec^2\theta}{\tan\theta}$	**(A1)**	
	$\frac{\sec^2\theta\cos\theta}{\sin\theta}$ oe **and** completion to given answer $\sec\theta\,\text{cosec}\,\theta$	**(A1)**	
2(a)	$\left[\frac{dy}{dx}=\right]$ $\tan^2x$ nfww	**B2**	**B1** for $\sec^2x - 1$
2(b)	$[\tan x - x]_0^{\frac{\pi}{4}}$	**M1**	
	$1-\frac{\pi}{4}$ or exact equivalent	**A1**	
3(a)	$\left(8^{\frac{1}{x}}\right)^2 - 8^{\frac{1}{x}} - 2\ [=0]$ oe or $\left(2^{\frac{3}{x}}\right)^2 - 2^{\frac{3}{x}} - 2\ [=0]$ oe	**B1**	
	$(8^{\frac{1}{x}} - 2)(8^{\frac{1}{x}} + 1) = 0$ oe or $(2^{\frac{3}{x}} - 2)(2^{\frac{3}{x}} + 1) = 0$ oe	**M1**	**FT** *their* 3-term quadratic in $8^{\frac{1}{x}}$ oe
	$8^{\frac{1}{x}} = 2\ \left[8^{\frac{1}{x}} = -1\right]$ or $2^{\frac{3}{x}} = 2\ \left[2^{\frac{3}{x}} = -1\right]$ oe	**A1**	
	$x = 3$ nfww	**A1**	

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Question	Answer	Marks	Partial Marks
3(b)	$a^2 - 2\sqrt{3}a + 3$ [= $b + (3 - b)\sqrt{3}$]	**B1**	
	Equates coefficients to form two equations	**M1**	**FT** *their*($a^2 - 2\sqrt{3}a + 3$) = $b + (3 - b)\sqrt{3}$ providing of equivalent difficulty
	$a^2 + 3 = b$ and $-2a = 3 - b$ oe	**DM1**	**FT** *their*($a^2 - 2\sqrt{3}a + 3$) = $b + (3 - b)\sqrt{3}$
	$a^2 - 2a$ [= 0] or $b^2 - 10b + 21$ [= 0]	**DM1**	
	$a = 2, 0$ or $b = 3$ or 7	**A1**	
	$a = 2, b = 7$ **and** $a = 0, b = 3$	**A1**	
4	$\mathbf{b} - \mathbf{a} = \frac{p}{p+q}(\mathbf{c} - \mathbf{a})$ oe AND Correct completion to given answer $\mathbf{b} = \frac{q\mathbf{a} + p\mathbf{c}}{q+p}$	**5**	**B4** for $\mathbf{b} - \mathbf{a} = \frac{p}{p+q}(\mathbf{c} - \mathbf{a})$ OR **B1** for $\overrightarrow{AB} = \frac{p}{p+q}\overrightarrow{AC}$ soi **B1** for $\overrightarrow{AB} = \mathbf{b} - \mathbf{a}$ soi **B1** for $\overrightarrow{AC} = \mathbf{c} - \mathbf{a}$ soi
	Alternative 1		
	$q(\mathbf{b} - \mathbf{a}) = p(\mathbf{c} - \mathbf{b})$ oe AND Correct completion to given answer $\mathbf{b} = \frac{q\mathbf{a} + p\mathbf{c}}{q+p}$	**(5)**	**B4** for $q(\mathbf{b} - \mathbf{a}) = p(\mathbf{c} - \mathbf{b})$ OR **B1** for $q\overrightarrow{AB} = p\overrightarrow{BC}$ soi **B1** for $\overrightarrow{AB} = \mathbf{b} - \mathbf{a}$ soi **B1** for $\overrightarrow{BC} = \mathbf{c} - \mathbf{b}$ soi
	Alternative 2		
	$\mathbf{b} = \mathbf{a} + \frac{p}{p+q}(\mathbf{c} - \mathbf{a})$ oe or $\mathbf{b} = \mathbf{c} + \frac{q}{p+q}(\mathbf{a} - \mathbf{c})$ oe AND Correct completion to given answer $\mathbf{b} = \frac{q\mathbf{a} + p\mathbf{c}}{q+p}$	**(5)**	**B4** for $\mathbf{b} = \mathbf{a} + \frac{p}{p+q}(\mathbf{c} - \mathbf{a})$ oe or $\mathbf{b} = \mathbf{c} + \frac{q}{p+q}(\mathbf{a} - \mathbf{c})$ oe OR **B1** for $\overrightarrow{OB} = \overrightarrow{OA} + \overrightarrow{AB}$ or $\overrightarrow{OB} = \overrightarrow{OC} + \overrightarrow{CB}$ soi **B1** for $\overrightarrow{AB} = \frac{p}{p+q}\overrightarrow{AC}$ or $\overrightarrow{CB} = \frac{q}{p+q}\overrightarrow{CA}$ soi **B1** for $\overrightarrow{AC} = \mathbf{c} - \mathbf{a}$ **or** $\overrightarrow{CA} = \mathbf{a} - \mathbf{c}$ soi

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