Question	Answer	Marks	Partial Marks
5(a)	$\frac{\sin x}{1-\sin x}+\frac{\sin x}{1+\sin x}$ or $\frac{\operatorname{cosec} x+1+\operatorname{cosec} x-1}{\operatorname{cosec}^2 x-1}$ oe	**M1**	
	$\frac{\sin x+\sin^2 x+\sin x-\sin^2 x}{1-\sin^2 x}$ or $\frac{2\operatorname{cosec} x}{\cot^2 x}$ oe	**A1**	
	$\frac{2\sin x}{\cos^2 x}$ or $\frac{2\sin^2 x}{\sin x\cos^2 x}$ oe	**A1**	
	Fully correct justification of given answer: $\frac{2\sin x}{\cos x}\times\frac{1}{\cos x}=2\tan x\sec x$ or $2\tan x\times\frac{1}{\cos x}=2\tan x\sec x$ or $\frac{2\sin x}{\cos x}\times\sec x=2\tan x\sec x$ or equivalent	**A1**	
5(b)	$2\tan^2 x=5$ or better, soi or $7\cos^2 x=2$ or better, soi or $7\sin^2 x=5$ or better, soi	**B1**	
	$\tan x=[\pm]\sqrt{\frac{5}{2}}$ oe or [±] 1.58[1…] or $\cos x=[\pm]\sqrt{\frac{2}{7}}$ oe or [±] 0.534[5…] or $\sin x=[\pm]\sqrt{\frac{5}{7}}$ oe or [±] 0.845[1…]	**M1**	**FT** an equation of the form $a\tan^2 x=b$ $a>0, b>0$ or $p\sin^2 x=q$ or $p\cos^2 x=q$ where $p>0$, $q>0$ and $p>q$
	57.7 or 57.6884… rot to 2 or more dp 237.7 or 237.6884… rot to 2 or more dp 122.3 or 122.3115… rot to 2 or more dp 302.3 or 302.3115… rot to 2 or more dp	**A2**	no extras in range **A1** for any two correct answers
6(a)	$y=(x-2)^2+4$ oe, isw	**B2**	**B1** for a correct expression in x and y only, that is not of the form $y=\mathrm{f}(x)$
6(b)	$\left[\frac{\mathrm{d}y}{\mathrm{d}x}=\right]2(x-2)$ oe	**B1**	**dep** on **B2** in **(a)**

Question	Answer	Marks	Partial Marks
6(c)	[When $\theta = \frac{\pi}{3}$] $x = 4$ soi	**B1**	
	[When $\theta = \frac{\pi}{3}$] $y = 8$ soi	**B1**	
	[When $x = 4$ or $\theta = \frac{\pi}{3}$] $\frac{dy}{dx} = 4$	**M1**	**FT** *their* $\left.\frac{dy}{dx}\right\|_{x=4}$ providing non-zero
	$y - 8 = 4(x - 4)$ oe isw	**A1**	**FT** *their* $\left.\frac{dy}{dx}\right\|_{x=4}$ providing non-zero
7(a)	**[p** =] $-15\mathbf{i} + 36\mathbf{j}$ isw	**B2**	**B1** for multiplier $\frac{39}{\sqrt{5^2 + 12^2}}$ soi or unit vector $\frac{-5\mathbf{i} + 12\mathbf{j}}{\sqrt{5^2 + 12^2}}$
	[q =] $30\mathbf{i} - 16\mathbf{j}$ isw	**B2**	**B1** for multiplier $\frac{34}{\sqrt{15^2 + 8^2}}$ soi or unit vector $\frac{15\mathbf{i} - 8\mathbf{j}}{\sqrt{15^2 + 8^2}}$ soi
7(b)	[**p** + **q** =] $15\mathbf{i} + 20\mathbf{j}$ or $\begin{pmatrix} 15 \\ 20 \end{pmatrix}$ soi	**B1**	
	$\left[\left\|\mathbf{p} + \mathbf{q}\right\| = \sqrt{15^2 + 20^2} = \right] 25$	**B1**	**FT** *their*(**p** + **q**) of the form $\begin{pmatrix} x \\ y \end{pmatrix}$ or $x\mathbf{i} + y\mathbf{j}$ where $x \neq 0$, $y \neq 0$
	53.1[°] or 53.13[01…] rot to 2 or more dp OR 0.927 [rads] or 0.9272[95…] rot to 4 or more sf	**B2**	**M1 FT** *their*(**p** + **q**) of the form $\begin{pmatrix} x \\ y \end{pmatrix}$ or $x\mathbf{i} + y\mathbf{j}$ where $x \neq 0$, $y \neq 0$ and $x \neq y$ for $\tan(...) = \frac{their\,20}{their\,15}$ oe or $\cos(...) = \frac{their\,15}{their\,25}$ oe or $\sin(...) = \frac{their\,20}{their\,25}$ oe

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