Question	Answer	Marks	Guidance
7(b)(ii)	$s=\frac{1}{3}(2t+4)^{\frac{3}{2}} \quad (+5t+d)$	**M1**	For $k(2t+4)^{\frac{3}{2}}$
	$\frac{1}{3}=\frac{64}{3}+30+d$	**M1**	**Dep** for attempt to find d using $s=\frac{1}{3}$ and $t=6$ in *their s*
	$\frac{1}{3}(2t+4)^{\frac{3}{2}}+5t-51$	**A1**	
8(a)	$x=\frac{\sqrt{3}+1}{2-\sqrt{3}}\times\frac{2+\sqrt{3}}{2+\sqrt{3}}$ leading to $x=\frac{5+3\sqrt{3}}{1}$	**M1**	For attempt to rationalise and simplify showing all working
	$x=5+3\sqrt{3}$	**A1**	
	Either: Using $x=5+3\sqrt{3}$ $y=\left(2-\sqrt{3}\right)\left(52+30\sqrt{3}\right)+5+3\sqrt{3}-1$ $=14+8\sqrt{3}+4+3\sqrt{3}$ Or: Using $x=\frac{\sqrt{3}+1}{2-\sqrt{3}}$ $y=\left(2-\sqrt{3}\right)\frac{\left(\sqrt{3}+1\right)^2}{\left(2-\sqrt{3}\right)^2}+\frac{\sqrt{3}+1}{2-\sqrt{3}}-1$ $=\frac{4+2\sqrt{3}+\sqrt{3}+1-2+\sqrt{3}}{2-\sqrt{3}}$ $=\frac{\left(4\sqrt{3}+3\right)}{2-\sqrt{3}}\times\frac{\left(2+\sqrt{3}\right)}{\left(2+\sqrt{3}\right)}$ $=\frac{8\sqrt{3}+6+12+3\sqrt{3}}{1}$	**M1**	For complete method, showing all steps. Allow one slip in arithmetic
	$11\sqrt{3}+18$	**2**	**A1** for 18 **A1** for $11\sqrt{3}$

Question	Answer	Marks	Guidance
8(b)	$\frac{\mathrm{d}y}{\mathrm{d}x}=2x\left(2-\sqrt{3}\right)+1$	**M1**	For attempt at differentiation to obtain form of $\frac{\mathrm{d}y}{\mathrm{d}x}=kx+1$
	$0=2x\left(2-\sqrt{3}\right)+1$ $x=-\frac{1}{2\left(2-\sqrt{3}\right)}\times\frac{\left(2+\sqrt{3}\right)}{\left(2+\sqrt{3}\right)}$ leading to $x=-\frac{1}{2}\frac{\left(2+\sqrt{3}\right)}{1}$	**M1**	**Dep** on previous M for equating to zero, rationalisation and attempt to simplify
	$x=-1-\frac{\sqrt{3}}{2}$	**A1**	
9(a)(i)	$(3y+2)(2x+1)$	**B1**	
9(a)(ii)	$(3\cos\theta+2)(2\sin\theta+1)=0$ $\cos\theta=-\frac{2}{3}$, $\sin\theta=-\frac{1}{2}$	**M1**	For relating to part (i) and a correct attempt to obtain $\cos\theta=...$ or $\sin\theta=...$
	$\theta=131.8^{\circ}$, 228.2° $\theta=210^{\circ}$, 330°	**3**	**M1** for solving one of the equations to obtain one correct solution **A1** for any two correct solutions **A1** for a further two correct solutions with no extra solutions within the range
9(b)	$\cos\left(2\phi+\frac{\pi}{4}\right)=\frac{\sqrt{3}}{2}$ oe	**B1**	
	$\phi=-\frac{5\pi}{24},-\frac{\pi}{24},\frac{19\pi}{24},\frac{23\pi}{24}$	**4**	**M1** for solving to obtain one correct positive solution **M1** for solving to obtain one correct negative solution **A1** for any two correct solutions **A1** for a further two correct solutions with no extra solutions within the range
10(a)	$\sin\frac{AOB}{2}=\frac{7.5}{10}$	**M1**	For a valid method
	$AOB=1.696$ = 1.70 to 2 dp	**A1**	Must see greater accuracy to justify given answer