Question	Answer	Marks	Partial Marks
11(b)	$\frac{3}{2}\left(16-x^2\right)^{\frac{1}{2}}\times(-2x)$	**2**	**M1** for attempt at chain rule **A1** for all correct unsimplified
	Area $=\int_1^3 x\left(16-x^2\right)^{\frac{1}{2}}\,\mathrm{d}x = \left[-\frac{1}{3}\left(16-x^2\right)^{\frac{3}{2}}\right]_1^3$ $=-\frac{1}{3}\left[7^{\frac{3}{2}}-15^{\frac{3}{2}}\right]=13.2$	**3**	**M1** for obtaining $k\left(16-x^2\right)^{\frac{3}{2}}$ **A1** for obtaining $k=-\frac{1}{3}$ **A1** for 13.2
12(a)	$\tan CAB=\frac{4}{3}$	**M1**	Correct use of tan oe
	$CAB=0.927$	**A1**	isw
12(b)	Angle $CBD=2\left(\frac{\pi}{2}-0.927\right)=1.287$	**B1**	
	Perimeter $=3(2\pi-2\times0.927)+4(2\pi-1.287)$ $=13.287+19.985$ $=33.3$	**3**	**M1** for correct plan of two arcs **A1** for either arc **A1**
12(c)	Area of two right-angled triangles $=\frac{1}{2}\times3\times4\times2=12$	**B1**	
	Area of Sectors $=\frac{3^2}{2}(2\pi-2\times0.927)+\frac{4^2}{2}(2\pi-1.287)$ $=19.93+39.97$ Total = 71.9	**3**	**M1** for correct plan of two sectors plus triangles **A1** for either sector **A1**

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