Question	Answer	Marks	Partial Marks
8(b)	$f^{-1}(x) = -\ln\frac{5-x}{2}$ or $f^{-1}(x) = \ln\frac{2}{5-x}$ oe	**2**	**M1** for a complete attempt to find the inverse function with at most one sign or arithmetic error: Putting $y = f(x)$ and changing subject to x and swopping x and y or swopping x and y and changing subject to y
	Correct simplified form e.g. $\left[f^{-1}g(x) =\right] -\ln\frac{2-5x}{2(1-x)}$ or $\left[f^{-1}g(x) =\right]\ln\frac{2-2x}{2-5x}$	**2**	**M1 FT** for a correct unsimplified form of the function; FT providing of equivalent difficulty
9(a)	$6.5\left(\frac{3\pi}{8}\right)+5.2\left(\frac{3\pi}{8}\right)+2(6.5-5.2)$	**M2**	**M1** for $6.5\left(\frac{3\pi}{8}\right)$ or $5.2\left(\frac{3\pi}{8}\right)$
	16.38 to 16.4	**A1**	
9(b)	[Angle PRQ =] 2ϕ soi	**B1**	
	$y = 2a\cos\phi$ oe or $y = \frac{a\sin(\pi-2\phi)}{\sin\phi}$ oe $y^2 = a^2 + a^2 - 2a^2\cos(\pi-2\phi)$ oe or $y^2 = a^2 + a^2 + 2a^2\cos(2\phi)$ oe	**B1**	
	Complete and correct plan soi: $\pi a^2 - \frac{1}{2}(2a\cos\phi)^2(2\phi)$ oe or $\pi a^2 - \frac{1}{2}\left(\frac{a\sin(\pi-2\phi)}{\sin\phi}\right)^2(2\phi)$ oe or $\pi a^2 - \frac{1}{2}(a^2 + a^2 - 2a^2\cos(\pi-2\phi))(2\phi)$ oe or $\pi a^2 - \frac{1}{2}(a^2 + a^2 + 2a^2\cos(2\phi))(2\phi)$	**M1**	**FT** *their* 2ϕ and *their* expression for y or y^2 in terms of a and ϕ
	$a^2\left(\pi - 4\phi\cos^2\phi\right)$ or $\pi a^2 - \frac{a^2\phi\sin^2(\pi-2\phi)}{\sin^2\phi}$ or $\pi a^2 - 2\phi(a^2 - a^2\cos(\pi-2\phi))$ or $\pi a^2 - 2\phi(a^2 + a^2\cos 2\phi)$ oe	**A1**	

Question	Answer	Marks	Partial Marks
10(a)(i)	$v = 3t^2 + c$	**M1**	
	$v = 3t^2 - 1$	**A1**	
	When $t = 3$ $v = 26$	**A1**	
10(a)(ii)	$s = t^3 - t + c$	**M1**	**FT** $kt^2 + c$
	$s = t^3 - t - 4$	**A1**	
	When $t = 3$ $s = 20$	**A1**	
10(b)	$v = \frac{-18e^3}{e^t} + c$ oe	**M1**	
	$v = \frac{-18e^3}{e^t} + 44$ oe	**A1**	**FT** (*their* 26) + 18
	$s = \frac{18e^3}{e^t} + their\,44t + d$ oe	**M1**	**dep** on previous **M1**
	$s = \frac{18e^3}{e^t} + 44t - 130$ oe, cao	**A1**	