Question	Answer	Marks	Partial Marks
4	$x + y = 9$	**B1**	
	$(x + 1)^2 = y + 2$	**B1**	
	$x + (x + 1)^2 - 2 = 9$ or $(10 - y)^2 = y + 2$	**M1**	Replace y or x. Allow unsimplified using *their* three term expressions both containing x and y terms. Condone one sign or arithmetic error. Result must be a quadratic function.
	$x^2 + 3x - 10$ (= 0) or $y^2 - 21y + 98$ (= 0)	**A1**	Correct 3 term quadratic
	$x = -5$ and $x = 2$ or $y = 7$ and $y = 14$ or $(x + 5)(x - 2)$ or $(y - 7)(y - 14)$	**M1**	**Dep** on correct method to solve their quadratic
	$x = 2$ and $y = 7$ **only**	**A1**	Reject $x = -5$, $y = 14$ as log –4 is not appropriate
5(a)	$x = 1 \rightarrow y = 8$	**B1**	
	$\frac{dy}{dx} = 3x^2 - 12x + 3$	**M1**	Attempt to differentiate. Powers reduced by 1 in all four terms.
	$x = 1 \rightarrow \frac{dy}{dx} = -6$	**A1**	
	$\frac{y-8}{x-1} = -6 \rightarrow y = -6x + 14$	**A1**	Either form. isw
5(b)	$x^3 - 6x^2 + 9x - 4 = 0$ $(x - 1)(x^2 - 5x + 4) = 0$ or $(x - 4)(x^2 - 2x + 1) = 0$	**2**	**M1** for equating *their* tangent to curve and simplifying to 4 term cubic. **M1Dep** for finding a factor or stating that $(x - 1)$ is a factor or makes at least 3 attempts to find a factor.
	$(x - 1)(x - 1)(x - 4) = 0$	**2**	**A1** for $(x - 1)$ or $x = 1$ can be implied. nfww **A1** for $(x - 4)$ or $x = 4$ not repeated. nfww
	$x = 4 \rightarrow y = -10$ only	**A1**	nfww

Question	Answer	Marks	Partial Marks
6	$\frac{(x+1)^2}{x^2}=\frac{x^2+2x+1}{x^2}=1+\frac{2}{x}+\frac{1}{x^2}$	**2**	**B1** for expanding numerator seen anywhere. **M1** for attempt to divide *their* three term numerator by x^2.
	$\int 1+\frac{2}{x}+\frac{1}{x^2}\mathrm{d}x=x+2\ln x-\frac{1}{x}+(c)$	**2**	**A2/1/0** minus 1 each error or omission.
	$\left[4-2\ln 4-\frac{1}{4}\right]-\left[2+2\ln 2-\frac{1}{2}\right]$	**M1**	**Dep** insert 4 and 2 into *their* three or two term integrand and subtract correctly.
	$=\frac{9}{4}+2\ln 2$	**A1**	oe must be exact two terms. isw
7 (a)	$a=3 \quad r=\frac{2.4}{3}=0.8$	**B1**	
	$S_8=\frac{3(1-0.8^8)}{(1-0.8)}$	**M1**	Inserts *their* a and r into S_8
	= 12.48 awrt or 12.5	**A1**	
7(b)	$S_\infty=\frac{3}{(1-0.8)}=15$	**B1**	
7(c)	$S_n = 15(1-0.8^n) > 0.95\times 15$	**M1**	*their* correctly produced $S_n > 0.95S_\infty$
	$0.8^n < 0.05$	**A1**	oe
	$n < \frac{\log 0.05}{\log 0.8}$ or $n<\log_{0.8}0.05$	**M1**	**Dep** takes logs correctly of *their* expression with power of n.
	$n = 14$	**A1**	nfww
8(a)	$\frac{1}{2}(2\sqrt{3}+1)AC\sin 30° = \frac{11}{2}$	**M1**	Correct use of area of a triangle
	$(2\sqrt{3}+1)AC = 22$	**A1**	oe
	$AC=\frac{22}{(2\sqrt{3}+1)}\times\frac{(2\sqrt{3}-1)}{(2\sqrt{3}-1)}$	**M1**	Multiply by *their* $(2\sqrt{3}+1)$
	$AC = 4\sqrt{3}-2$	**A1**	