Question	Answer	Marks	Partial Marks
8(a)	$\frac{dy}{dx} = -5(x-1)^{-2} + 2$ oe	**B2**	**B1** for $\frac{d}{dx}(-5(x-1)^{-1}) = k(x-1)^{-2}$ soi
	$(x-1)^2 = \frac{5}{2}$ or $2x^2 - 4x - 3 = 0$	**M1**	**dep** on at least **B1**
	$x = 1 + \frac{\sqrt{10}}{2}$ oe, isw or 2.58[11…]	**A1**	implies **M1**
	$y = 2 + 2\sqrt{10}$ oe, isw or 8.32 to 8.325	**A1**	
8(b)	[Area of triangle =] 9 soi	**B1**	
	[Area under curve = F(x) =] $\left[5\ln(x-1) + \frac{2x^2}{2}\right]_2^4$ oe	**M2**	**M1** for $\int \frac{5}{x-1}\,dx = k\ln(x-1)$ $k \neq 0$ soi or for $5\ln x - 1$
	their 9 + F(4) – F(2)	**M1**	**dep** on at least **M1**
	21 + 5ln3 isw or 26.49 to 26.5	**A1**	
9(a)	Attempts to solve $a + 2d = 13$ and $a + 9d = 41$ oe	**M2**	**M1** for $a + 2d = 13$ and $a + 9d = 41$ soi
	$d = 4$ and $a = 5$	**A2**	**A1** for $d = 4$ or $a = 5$
9(b)	$\frac{n}{2}\{2(5) + (n-1)4\}$ soi	**M1**	**FT** *their a* and *their d*
	$2n^2 + 3n - 2555\,[*0]$	**A1**	where * could be = or any inequality sign
	Solves *their* 3-term quadratic of the form $ax^2 + bx + c$ [*0] by factorising or formula or *their* 3-term quadratic of the form $ax^2 + bx * c$ or better if completing the square	**M1**	
	35	**A1**	

Question	Answer	Marks	Partial Marks
9(c)	May work ***consistently*** in n throughout but must conclude in k to earn the final mark		
	$S_{2k} = \frac{2k}{2}\{10 + (2k-1)4\}$ soi	**B1**	**FT** *their a* and *their d*
	$\frac{2k}{2}\{10 + (2k-1)4\} - \frac{k}{2}\{10 + (k-1)4\}$ soi	**M1**	**FT** *their a* and *their d* ; condone at most one error
	Simplifies as far as e.g. $8k^2 + 6k - (3k + 2k^2)$ or $8k^2 + 6k - 3k - 2k^2$	**A1**	
	Correct completion to given answer: $6k^2 + 3k = 3k(1 + 2k)$	**A1**	
	Alternative method		
	$\frac{2k}{2}\{2a + (2k-1)d\}$ **and** a = *their* 5 and d = *their* 4 substituted at some point	**(B1)**	
	$ak - \frac{d}{2}k + \frac{3}{2}dk^2$ oe	**(M1)**	condone at most one error
	$5k - \frac{4}{2}k + \frac{3}{2} \times 4 \times k^2$	**(A1)**	
	Correct completion to given answer: $6k^2 + 3k = 3k(1 + 2k)$	**(A1)**	
10(a)	$[f'(x) =] 12x^2 - 8x - 15$	**M2**	**M1** for any two terms correct or $12x^2 - 8x - 15 + c$
	$y = 3$ and $f'(1) = -11$	**A1**	
	$[m_{\perp} =] \frac{1}{11}$ soi	**M1**	**FT** $\frac{-1}{\textit{their}\, f'(1)}$
	$y - 3 = \frac{1}{11}(x-1)$ oe, isw	**A1**	**FT** *their* $m_{\perp}$ and *their* 3, provided *their* $3 \neq 1$ or 0 or -11