Question	Answer	Marks	Guidance
10(a)	$\frac{dy}{dx} = (2x+3)^{\frac{1}{2}} + 5x(+c)$	**B1**	For $(2x+3)^{\frac{1}{2}}$, allow unsimplified
		M1	For $k(2x+3)^{\frac{1}{2}} + 5x$
	$10 = 3 + 15 + c$	**M1**	**Dep** for use of 10 and $x=3$ in *their* $\frac{dy}{dx}$ to obtain c
	$\frac{dy}{dx} = (2x+3)^{\frac{1}{2}} + 5x - 8$ soi	**A1**	
	When $x = 11$, $\frac{dy}{dx} = 5 + 55 - 8$ oe $= 52$	**A1**	**AG –** need to see sufficient detail
10(b)	$f(x) = \frac{1}{3}(2x+3)^{\frac{3}{2}} + \frac{5x^2}{2}(-8x+d)$	**B1**	For $\frac{1}{3}(2x+3)^{\frac{3}{2}}$, must be $\int (2x+3)^{\frac{1}{2}}\,dx$
		M1	For $k(2x+3)^{\frac{3}{2}} + \frac{5x^2}{2}$
	$\frac{19}{2} = \frac{27}{3} + \frac{45}{2} - 24 + d$ $d = 2$	**M1**	For use of $y = \frac{19}{2}$ and $x = 3$ in *their y*
	$(f(x) =)\ \frac{1}{3}(2x+3)^{\frac{3}{2}} + \frac{5x^2}{2} - 8x + 2$	**A1**	Allow -8 if obtained from using $\frac{dy}{dx} = 52$ in **(a)** rather than $\frac{dy}{dx} = 10$
11(a)	$\frac{dy}{dx} =$ $\frac{(x+1)\left(\frac{1}{3}\times 2x\times\left(x^2-5\right)^{-\frac{2}{3}}\right) - \left(x^2-5\right)^{\frac{1}{3}}}{(x+1)^2}$ or $(x+1)^{-1}\left(\frac{1}{3}\times 2x\times\left(x^2-5\right)^{-\frac{2}{3}}\right)$ $+\left(x^2-5\right)^{\frac{1}{3}}\left(-(x+1)^{-2}\right)$	**3**	**B1** for $\frac{1}{3}\times 2x\times\left(x^2-5\right)^{-\frac{2}{3}}$ **M1** for an attempt at a quotient or a correct product **A1** for all other terms correct
	$\frac{-x^2+2x+15}{3(x+1)^2\left(x^2-5\right)^{\frac{2}{3}}}$	**3**	**Dep on first 3 marks** **A1** for $-x^2$ in a quadratic numerator **A1** for $2x$ in a quadratic numerator **A1** for 15 in a quadratic numerator

Question	Answer	Marks	Guidance
11(b)	$-x^2 + 2x + 15 = 0$	**M1**	For attempt to solve *their* $-x^2 + 2x + 15 = 0$ to obtain $x = ..$ Must be a quadratic equation.
	$x = 5$ only	**A1**	
11(c)	**Either** Find the gradient either side of the stationary point	**B1**	
	If gradient changes from +ve to -ve: max If gradient changes from -ve to +ve: min	**B1**	**Dep** on previous **B1**
	Or Alternative 1 Take the second derivative and substitute in the value of x obtained in **(b)**	**(B1)**	Allow alternative valid methods Allow a general method as this is not dependent on **(a)** or **(b)**
	If second derivative is + ve, then a min If second derivative is – ve, then a max	**(B1)**	**Dep** on previous **B1**
	Or Alternative 2 Consider a y-value to one side of the stationary point	**(B1)**	Allow alternative valid methods Allow a general method as this is not dependent on **(a)** or **(b)**
	If y value of stationary point is greater, then a max. If y value of stationary point is less, then a min.	**(B1)**	**Dep** on previous **B1**

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