Question	Answer	Marks	Guidance
4	$\left(\frac{dy}{dx}=\right)\ \frac{1}{2}(3x+2)^{\frac{2}{3}}\ \ (+c)$	**M1**	For $k_1(3x+2)^{\frac{2}{3}}$ where k_1 a constant.
	$4=2+c$	**M1**	**Dep** for use of 4 and $x=2$ in *their* $\frac{dy}{dx}$ to obtain c
	$\left(\frac{dy}{dx}=\right)\ \frac{1}{2}(3x+2)^{\frac{2}{3}}+2$	**A1**	May be implied by subsequent integration or by $c=2$
	$y=\frac{1}{10}(3x+2)^{\frac{5}{3}}\ \ \ (+2x+d)$	**M1**	For $k_2(3x+2)^{\frac{5}{3}}$ where k_2 is a constant.
	$6.2=\frac{1}{10}(32)+4+d$	**M1**	**Dep** on previous M1 for use of $x=2$ and $y=6.2$ in *their y*
	$y=\frac{1}{10}(3x+2)^{\frac{5}{3}}+2x-1$	**A1**	Must be an equation
5(a)	$p=16$	**2**	**B1** for $\log_a\frac{5p}{4}=\log_a 20$ oe **B1** for 16, nfww
5(b)	$\left(3\left(3^x\right)-1\right)\left(3^x+3\right)=0$	**M1**	For recognition of a correct quadratic in 3^x and attempt to factorise or use quadratic formula
	$3^x=\frac{1}{3}$ $x=-1$	**2**	**M1 dep** for a correct attempt to solve $3^x=k,\ k>0$ **A1** for one solution only, must be from a correct solution.

Question	Answer	Marks	Guidance
5(c)	$\log_y 2 = \dfrac{1}{\log_2 y}$ or $\log_2 y = \dfrac{1}{\log_y 2}$ or $\log_y 2 = \dfrac{\log_a 2}{\log_a y}$ **and** $\log_2 y = \dfrac{\log_a y}{\log_a 2}$	**B1**	May be implied
	$4(\log_y 2)^2 - 4(\log_y 2) + 1 = 0$ $(2\log_y 2 - 1)^2 = 0$, $\log_y 2 = \dfrac{1}{2}$ or $(\log_2 y)^2 - 4(\log_2 y) + 4 = 0$ $(\log_2 y - 2)^2 = 0$, $\log_2 y = 2$ or $(\log_a y)^2 - 4(\log_a 2)(\log_a 4)\log_a y$ $+4(\log_a 2)^2 = 0$ $(\log_a y - 2\log_a 2)^2 = 0$ $\log_a y = 2\log_a 2$	**M1**	For obtaining a 3 term quadratic equation in either $\log_y 2$ or $\log_2 y$ and solving to obtain $\log_y 2 = k$ or $\log_2 y = k$, may be implied or equivalent using an alternative base.
	$y = 4$	**A1**	nfww
6(a)	$\dfrac{dy}{dx} = 2(3+\sqrt{5})x - 8\sqrt{5}$ or $x = \dfrac{8\sqrt{5}}{2(3+\sqrt{5})}$	**M1**	Either For differentiation must have one correct term. or for use of '$b^2 - 4ac = 0$', so $x = -\dfrac{b}{2a}$ at the stationary point.
	$x = \dfrac{4\sqrt{5}}{3+\sqrt{5}} \times \dfrac{(3-\sqrt{5})}{(3-\sqrt{5})}$ oe leading to $\dfrac{12\sqrt{5}-20}{4}$ oe, this is the minimum acceptable working for this method.	**M1**	**Dep** for equating *their* $\dfrac{dy}{dx}$ to zero with attempt to solve and rationalisation using a two term factor, or rationalisation of $x = -\dfrac{b}{2a}$, using a two term factor with sufficient detail to imply no use of a calculator. Allow multiple equivalents. Allow one numerical slip or sign error.
	$x = -5 + 3\sqrt{5}$	**2**	**A1** for -5 **A1** for $3\sqrt{5}$