Question	Answer	Marks	Partial Marks
1	$\frac{4-\sqrt{5}}{7-3\sqrt{5}}\times\frac{7+3\sqrt{5}}{7+3\sqrt{5}}$ attempted	**M1**	
	Correct expansion $\frac{28+12\sqrt{5}-7\sqrt{5}-15}{49-45}$	**M1**	**DEP** condone one arithmetic or sign slip
	$\frac{13+5\sqrt{5}}{4}$ or simplified equivalent	**A1**	
2	Attempts to solve $2(7^{2x})-21(7^{x})-11=0$ or uses $u=7^{x}$ and attempts to solve $2u^{2}-21u-11=0$	**B1**	
	$(2(7^{x})+1)(7^{x}-11)$ or $(2u+1)(u-11)$	**M1**	**FT** *their* $2(7^{2x})+b(7^{x})+c=0$ or $2u^{2}+bu+c=0$ with b and c both non-zero
	$[7^{x}=-\frac{1}{2}$ or$]\quad 7^{x}=11$	**A1**	
	$x=\log_{7}11$ or $\frac{\ln 11}{\ln 7}$ or $\frac{\lg 11}{\lg 7}$ isw or 1.23[227...] only	**A1**	
3(a)	$3^{4}\times x^{\frac{8}{3}}\times y^{\frac{15}{4}}$	**B3**	**B1** for each correct power or **M1** for $\frac{x\left(243x^{\frac{5}{3}}y^{5}\right)}{3y^{\frac{5}{4}}}$ or better
3(b)(i)	$a^{\frac{3}{2}}=64$ or $a^{\frac{3}{4}}=8$ oe	**M1**	
	$a=16$	**A1**	If 0 scored, **SC1** for correctly finding a from $\log_{a}8=k$, where $k\neq 0.75$
3(b)(ii)	Correct change of base to a: $\frac{\log_{a}3a}{\log_{a}a^{2}}$ oe	**M1**	
	Simplifies denominator: $\log_{a}(3a)^{\frac{1}{2}}$ oe	**A1**	

Question	Answer	Marks	Partial Marks
4	$y = \tan x$	**B1**	
	$\frac{\mathrm{d}y}{\mathrm{d}x} = \sec^2 x$	**B1**	**Alternative method for first 2 marks:** **B1** for $\frac{\mathrm{d}u}{\mathrm{d}x} = \cos x$ and $\frac{\mathrm{d}v}{\mathrm{d}x} = -\sin x$ **B1** for $\frac{\cos^2 x - (-\sin^2 x)}{\cos^2 x}$; allow unsimplified
	$\frac{\delta y}{h} = their \left.\frac{\mathrm{d}y}{\mathrm{d}x}\right\|_{x=-\frac{\pi}{4}}$	**M1**	
	$2h$	**A1**	
5(a)	$(2x - 3)(x - 7)$	**M1**	
	CV 1.5, 7	**A1**	
	$1.5 \leqslant x \leqslant 7$ nfww	**A1**	**FT** *their* CVs
5(b)	$\int_{their\,1.5}^{their\,7} (2x^2 - 17x + 21)\,\mathrm{d}x$ $= \left[\frac{2x^3}{3} - \frac{17x^2}{2} + 21x\right]_{their\,1.5}^{their\,7}$	**B1**	
	F(*their* 7) – F(*their* 1.5)	**M1**	**FT** *their* 7 and *their* 1.5 from (a); must have at least two terms correct
	$[-\frac{1331}{24}$, therefore area =] $\frac{1331}{24}$ isw or 55.5 or 55.4583333... rot to 4 or more sig figs; nfww	**A1**	
6(a)	p(–0.25) = $36(-0.25)^3 - 15(-0.25)^2 - 2(-0.25) + 1$ = 0 oe	**B1**	