Question	Answer	Marks	Partial Marks
5(a)	$2\left(x-\frac{1}{2}\right)^2+\frac{5}{2}$	**3**	**B2** for $2\left(x-\frac{1}{2}\right)^2$ or **B1** for $\left(x-\frac{1}{2}\right)^2$ or $a = 2$ and $b = –0.5$ oe **B1** for $\frac{5}{2}$ or $c = 2.5$ oe
5(b)	$\frac{1}{2}$	**B1**	**FT** *–their b*
5(c)	$f \geqslant \frac{5}{2}$	**B1**	**FT** *their c*
5(d)	$\left[f^{-1}(x) =\right] \frac{1}{2}-\sqrt{\frac{1}{2}\left(x-\frac{5}{2}\right)}$ oe or $\left[f^{-1}(x) =\right] \frac{2-\sqrt{8x-20}}{4}$ oe	**3**	**M1 FT** for a complete method to find the inverse with a correct order of operations **FT** an expression of the form $f(x) = a(x+b)^2+c$ **A1 FT** for $\left[f^{-1}(x) =\right] \frac{1}{2} \pm \sqrt{\frac{1}{2}\left(x-\frac{5}{2}\right)}$ oe **FT** *their* $\frac{1}{2}$ and *their* $\frac{5}{2}$
6(a)	$\cos\theta = -\sqrt{\frac{5}{6}}$ oe, isw	**B2**	**B1** for $\cos\theta = \sqrt{\frac{5}{6}}$ oe or $\cos\theta = \pm\sqrt{\frac{5}{6}}$ oe
6(b)	$\sin\theta = -\sqrt{\frac{1}{6}}$ oe, isw	**B1**	
6(c)	$\frac{5-[1]\sqrt{6}}{\sqrt{5}}$	**2**	**M1** for $[\sec\theta + \cot\theta =] \frac{1}{\cos\theta}+\frac{1}{\tan\theta}$ or $\frac{1}{\cos\theta}+\frac{\cos\theta}{\sin\theta}$ soi or for $\frac{1}{their\cos\theta}+\frac{5}{\sqrt{5}}$ oe or $\frac{1}{their\cos\theta}+\frac{their\cos\theta}{their\sin\theta}$

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Question	Answer	Marks	Partial Marks
7(a)	$(2x+1)(x+1)=5+2(x+1)$ or $(2x-1)(x+1)=5$ oe	**M1**	
	$2x^2+x-6[=0]$	**A1**	
	Factorises or solves *their* 3-term quadratic e.g. $(x + 2)(2x – 3)$	**M1**	
	$\left(\frac{3}{2}, 4\right)$	**A1**	
7(b)	Correct plan, difference of integrals oe: $\int_0^k\left(\frac{5}{x+1}+2\right)\mathrm{d}x$ – area correct trapezium soi where $k > 0$	**M1**	or $\int_0^k\left(\frac{5}{x+1}+2\right)\mathrm{d}x - \int_0^k(2x+1)\mathrm{d}x$ soi
	Area of trapezium: $\frac{1}{2}(their4+1)\left(their\frac{3}{2}\right)$ oe	**B1**	or $\left(their\frac{3}{2}\right)^2+their\frac{3}{2}$ [–0] or $\frac{15}{4}$ oe
	Integral: $\left[5\ln(x+1)+2x\right]_0^{their1.5}$	**B2**	**B1** for $5\ln x + 1$ or for $n\ln(x + 1)$ where n is a constant and $n > 0$
	Correct substitution of upper and lower limits into $5\ln(x+1)+2x$	**M1**	**FT** *their* integral providing at least **B1** awarded and *their* 1.5
	Area of shaded region: $5\ln\left(\frac{5}{2}\right)-\frac{3}{4}$ isw	**A1**	
	Alternative method		
	Correct plan, integral of difference of functions: $\int_0^k\left(\frac{5}{x+1}-2x+1\right)\mathrm{d}x$ soi where $k > 0$	**(M1)**	
	Integral: $\left[5\ln(x+1)+x-x^2\right]_0^{their1.5}$	**(B3)**	**B2** for $5\ln(x + 1)$ and one other correct term or $n\ln(x + 1) + x – x^2$ where n is a constant and $n > 0$ or **B1**for $5\ln x + 1$ or for $n\ln(x + 1)$ where n is a constant and $n > 0$
	Area of shaded region: $5\ln\left(\frac{5}{2}\right)-\frac{3}{4}$ isw	**(2)**	**M1FT** for correct substitution of upper and lower limits; **FT** *their* integral providing at least **B1** awarded and *their* 1.5

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