Question	Answer	Marks	Guidance
1	$p^{-\frac{3}{2}}q^{\frac{8}{3}}r^{-2}$	**3**	**B1** for $a=-\frac{3}{2}$ **B1** for $b=\frac{8}{3}$ **B1** for $c=-2$
2(a)	$\frac{ds}{dt}=-\frac{3}{2}(1+3t)^{-\frac{3}{2}}$	**2**	**M1** for $a(1+3t)^{-\frac{3}{2}}$ **A1** all correct
	When t = 1, $\frac{ds}{dt}=-\frac{3}{16}$ Speed = $\frac{3}{16}$	**A1**	
2(b)	Acceleration = $\frac{27}{4}(1+3t)^{-\frac{5}{2}}$	**B1**	Allow unsimplified
	$(1+3t)^{-\frac{5}{2}}$ is always positive (so acceleration can never be zero.)	**B1**	Any valid explanation.
3(a)	$f(x) \in \mathbb{R}$ oe	**B1**	Must be using correct notation, allow $y \in$
3(b)	$5(\ln(3x+1))-7=13$	**M1**	For correct order
	$x=\frac{e^4-1}{2}$	**2**	**M1** for a correct attempt to solve to get $x=$, allow one sign error **Dep** on previous M mark **A1** all correct must be exact
3(c)	$(f'(x)=)\ \frac{2}{2x+1}$	**2**	**M1** for $\frac{a}{2x+1}$ **A1** all correct
	$(g^{-1}(x)=)\ \frac{x+7}{5}$	**B1**	soi
	$2x^2+15x-3=0$	**M1**	for equating and forming a 3-term quadratic equation = 0
	$x = 0.195, -7.69$	**M1**	For solution of *their* 3-term quadratic
	$x = 0.195$	**A1**	For discounting negative root.
4(a)	$[f(x)=]\pm 4(x+2)(x-1)(x-3)$	**3**	**B1** for $\pm$ **B1** for 4 **B1** for $(x+2)(x-1)(x-3)$