	Alternative: $2y^2+1-\frac{15}{y^2}=0\Rightarrow\left(2y-\frac{5}{y}\right)\left(y+\frac{3}{y}\right)=0$ M1: Factorises allowing for sign/coefficient errors only A1: Correct factorisation $2y-\frac{5}{y}=0\Rightarrow 2y^2-5=0\Rightarrow y^2=\frac{5}{2};\qquad y=\pm\sqrt{\frac{5}{2}}\text{ or }\pm\frac{\sqrt{10}}{2}$ dM1: Proceeds with sign/coefficient errors only to a real value for y^2. Do not condone if this is mis-labelled e.g., as $y=...$ if should be $y^2=...$ A1A1: as above	
		(5)
		Total 5

Question Number	Scheme	Notes	Marks
4	$P(-1, 4),\quad Q(4, 7),\quad R(p, -3)$		
(a)	{Gradient PQ =} $\dfrac{y_1 - y_2}{x_1 - x_2} = \dfrac{7-4}{4-(-1)}\left\{= \dfrac{3}{5}\right\}$ Correct attempt at gradient of PQ which may be unsimplified. There must be no evidence of obtaining this fortuitously e.g. by use of an incorrect formula. See below for methods involving simultaneous equations.		**B1**
	$y-4=\dfrac{3}{5}(x-(-1))$ or $4=\dfrac{3}{5}(-1)+c,\ \Rightarrow c=...\left\{\dfrac{23}{5}\right\}\Rightarrow y=...$ $y-7=\dfrac{3}{5}(x-4)$ or $7=\dfrac{3}{5}(4)+c,\quad \Rightarrow c=...\left\{\dfrac{23}{5}\right\}\Rightarrow y=...$ Obtains a consistent equation of the line for their gradient using point P or Q. Allow this mark with any gradient If $y=mx+c$ must correctly substitute, reach $c=...$ and form equation unless "$y=mx+c$" seen. **Score the first two marks together** for $\dfrac{y-4}{7-4}=\dfrac{x-(-1)}{4-(-1)}$ or $\dfrac{y-7}{7-4}=\dfrac{x-4}{4-(-1)}$ or $4=-m+c,\ 7=4m+c\Rightarrow m=\dfrac{3}{5},\ c=\dfrac{23}{5}\Rightarrow y=\dfrac{3}{5}x+\dfrac{23}{5}$ Allow simultaneous equations to be solved by calculator		**M1**
	$\Rightarrow 3x-5y+23=0$ or an integer multiple e.g., $-3x+5y-23=0$ Allow terms in any order but all on one side with = 0 Only allow e.g., $a=-3,\ b=5,\ c=-23$ if $ax+by+c=0$ is seen		**A1**
			(3)
(b)	Question has: "Solutions relying on calculator technology are not acceptable"		
	e.g., Gradient PR = "$-\dfrac{5}{3}$" $\Rightarrow \dfrac{-7}{p+1}=$ "$-\dfrac{5}{3}$" Correctly takes negative reciprocal of a positive value $\neq 1$ and forms a correct consistent ft linear equation in p (or other variable) by an appropriate method. **OR** e.g., $(p+1)^2+7^2+5^2+3^2=(p-4)^2+10^2$ Alternatively, uses Pythagoras correctly to obtain a correct implied linear equation. Note that it is possible to form an equation using trigonometry. If so it must be consistent and correct and must not have any trig expressions. **OR** e.g, $4=-\frac{5}{3}(-1)+c,\ -3=-\frac{5}{3}p+c\Rightarrow 7=\frac{5}{3}+\frac{5}{3}p$ or $c=\frac{7}{3}\Rightarrow -3=-\frac{5}{3}p+\frac{7}{3}$ Award for appropriate simultaneous equations using P and R and the correct negative reciprocal of their positive gradient. Must also combine their equations correctly for their gradient which can be implied by $\frac{16}{5}$ with no wrong working, provided there has been some working which might e.g., be just writing down the simultaneous equations		**M1**
	e.g., $5p+5=21\Rightarrow p=\dfrac{16}{5}$ or $2p+84=116-8p\Rightarrow 10p=32\Rightarrow p=\dfrac{16}{5}$		**dM1** **A1**

	dM1: Solves linear equation in p. This is not implied by just $p=\frac{16}{5}$ - must see a previous linear equation or $\frac{-7}{p+1}=\text{"}-\frac{5}{3}\text{"}$ (Condone using another variable) A1: $p=\frac{16}{5}$, $3\frac{1}{5}$ or 3.2 Accept just $\frac{16}{5}$ but not if labelled as x = ... etc.	
		(3)
		Total 6