Question number	Scheme	Marks
6 a	$r = \dfrac{q(2p-3)}{q(2p+3)} = \dfrac{q(2p+3)}{q(4p+1)}$	M1
	$(4p+1)(2p-3) = (2p+3)^2$	dM1
	$2p^2 - 11p - 6 = 0$	A1
	$(2p+1)(p-6) = 0$	M1
	$p = -\dfrac{1}{2}$ or $p = 6$	A1 (5)
b	When $p = 6$ $r = \dfrac{3}{5}$ and $U_1 = q\left(4\times'6'+1\right) = \left(25q\right)$	M1
	$S_\infty = \dfrac{25q}{\frac{2}{5}} = 250 \Rightarrow q = 4$	dM1 A1 (3)
		Total 8 marks

Part	Mark	Notes
(a)	M1	For $r = \frac{\text{3rd term}}{\text{2nd term}} = \frac{\text{2nd term}}{\text{1st term}}$
	dM1	For attempting to remove the denominators/simplifying the expression to attempt to obtain a 3TQ. Allow one processing error. Allow a minimally acceptable $4p^2 \pm Xp \pm Y = (0)$ or $2p^2 \pm Pp \pm Q = (0)$ $X, Y, P, Q \neq 0$ **Note:** This mark is dependent on the previous M mark.
	A1	For obtaining $2p^2 - 11p - 6 = (0)$ or equivalent. Their working will give them $4p^2 - 22p - 12 = (0)$ before further simplification
	M1	For a valid attempt to solve the 3TQ. Note this is an independent mark for their 3TQ. See General Guidance. The 3TQ must have come from some attempted manipulation involving $q(2p-3)$, $q(2p+3)$ and $q(4p+1)$
	A1	For $p = -\frac{1}{2}$ or $p = 6$
(b)	M1	For finding: • A value of r for their p. Allow any value of r $r \neq 0$ E.g. $r = \frac{(2\times'6'-3)}{(2\times'6'+3)} = ...$ $\left(\text{Note: for } p = -\frac{1}{2} \quad r = -2\right)$ • A value for U_1 $U_1 = q(4\times'6'+1) = ...$ $\left(\text{Note: for } p = -\frac{1}{2}, U_1 = -q\right)$ You may see a = 100 after later working to find the sum to infinity. If their values of p are incorrect, we **must** see working here. **NOTE:** This is a B mark in Epen.
	dM1	For use of $S_\infty = \frac{a}{1-r} = 250$ with their r and their U_1 provided $\lvert r\rvert < 1$ If they use the formula for the sum to infinity on an $\lvert r\rvert > 1$ withhold this mark even if they use it on one valid and one invalid attempt. **Note:** This mark is dependent on the previous M mark.
	A1	For $q = 4$