Question	Scheme	Marks
3(a)	$\left(\sum_{r=1}^{n}(5r-3)\Rightarrow\right)a=2,\quad d=5$	B1
	$\left(\sum_{r=1}^{n}(5r-3)=\right)\frac{n}{2}\left(2\times2+(n-1)5\right)$ or $\frac{n}{2}(4+5n-5)$	M1
	or $\frac{n}{2}\left(2+2+(n-1)5\right)$ or $\frac{n}{2}(2+5n-3)$	
	$=\frac{n}{2}(5n-1)$*	A1 cso [3]
	ALT (Using standard results)	
	$\left(\sum_{r=1}^{n}(5r-3)=\right)5\sum_{1}^{n}r-3\sum_{1}^{n}1$	B1
	$\left(\sum_{r=1}^{n}(5r-3)=\right)5\left[\frac{n}{2}(n+1)\right]-3n=\frac{5n^2+5n-6n}{2}=\frac{n}{2}(5n-1)$*	M1A1 cso [3]
(b)	$\left(\sum_{31}^{60}(5r-3)=\right)\frac{60}{2}(5\times60-1)-\frac{30}{2}(5\times30-1)=6735$	M1A1 [2]
	ALT	
	$\left(\sum_{31}^{60}(5r-3)=\right)\frac{30}{2}(152+297)=6735$	M1A1 [2]
	or $\left(\sum_{1}^{60}(5r-3)-\sum_{1}^{30}(5r-3)=\right)\frac{60}{2}(2\times2+(60-1)\times5)-\frac{30}{2}(2\times2+(30-1)\times5)=6735$	
(c)	$\frac{n}{2}(5n-1)=3783\Rightarrow5n^2-n-7566=0$	M1
	$\Rightarrow(5n+194)(n-39)=0$	M1
	$\Rightarrow n=39\quad\left[-\frac{194}{5}\right]$	A1 [3]
		Total 8 marks

Part	Mark	Notes
(a)	B1	For the values of a and d, these may be explicitly stated or implicitly used in a formula.
	M1	Correctly substitutes their values of a and d into the correct summation formula
	A1 cso	For the correct expression, minimum steps as shown, no errors or omissions.
	ALT	
	B1	For writing the given expression as $5\sum_{1}^{n} r - 3\sum_{1}^{n} 1$
	M1	For the sum shown, using standard results for the series.
	A1 cso	For the correct expression, minimum steps as shown, no errors or omissions.
(b)	M1	Uses the given expression with both $n = 60$ and $n = 30$ and subtracts. Indicated by 8970 – 2235. As a concession, allow substitution of $n = 31$ and 60 for the mark. **ALT** Correct substitution of the correct 'first' and 'last' value into the correct summation formula ie $\frac{30}{2}(152+297)$. Allow as a concession $\frac{29}{2}(152+297)$ or correct substitution of both $n = 30$ and $n = 60$ into the correct sum to n terms formula and a subtraction. Indicated by 8970 – 2235. As a concession, allow substitution of $n = 31$ and 60 for the mark.
	A1	For 6735
(c)	M1	For correctly placing the given expression = 3783 and rearranging (allow one error) to get a 3TQ = 0.
	M1	For solving their 3TQ and achieving at least one value. Minimum attempt to solve required (see general guidance). A correct value of 39 can imply this mark
	A1	For 39 only. If $-\frac{194}{5}$ is also given as a solution, withhold this mark.