1	$(4n^2+2n+2n+1)$ $-(2n+1)=$ $4n^2+4n+1-2n-1$ $= 4n^2 + 2n$ $= 2n(2n + 1)$	proof (supported)	M1 P1 C1	for 3 out of 4 terms correct in the expansion of $(2n + 1)^2$ **or** $(2n+1)\{(2n+1)-1\}$ for $4n^2 + 2n$ or equivalent expression in factorised form for convincing statement using $2n(2n + 1)$ or $2(2n^2 + n)$ or $4n^2 + 2n$ to prove the result

2		$2(2n-3)$ even	C1 C1 C1 C1	correct expansion of brackets to give at least 3 terms from $n^2-2n-2n+4$ arrives at n^2-2-n^2+4n-4 oe reduces to $2(2n-3)$ or $4n - 6$ for conclusion e.g. $2(2n-3)$ always even, $4n - 6$ is always even since both are even numbers, they are multiples of 2.

3			M1 M1 C1 M1 M1 C1	for the start of a method to convert 0.22.. to a fraction, eg$10y = 2.22..$ or $(y=)\,\frac{2}{9}$ for the start of a method to convert 0.13636... to a fraction, $10x = 1.3636..$ or $100x = 13.6363\ldots$ or $1000x = 136.3636..$ or $(x=)\_\,\frac{13.5}{99}$ or $(x=)\,\frac{135}{990}$ for correct arithmetic and concluding the proof OR for $0.1\dot{3}\dot{6} \times 0.\dot{2} = 0.\dot{0}\dot{3}\ (= z)$ for complete method to find two appropriate recurring decimals the difference of which is a rational number, eg. $100z = 3.0303\ldots, (z =)\ 0.0303\ldots$ or $\frac{3}{99}$ for correct arithmetic and concluding the proof

4		Proof to reach $\frac{24}{55}$	M1 M1 A1	for $100x = 43.636\ldots\ (43.\dot{6}\dot{3})$ **or** $10x = 4.3636\ldots\ (4.\dot{3}\dot{6})$ and $1000x = 436.36\ldots(436.\dot{3}\dot{6})$ (dep) for finding difference that would lead to a terminating decimal for completing algebra to reach $\frac{24}{55}$

5		Completes proof	M1 C1	Expands both expressions eg $\frac{1}{2}(n^2 + n + n^2 + n + 2n + 2)$ **or** $n^2 + n$ and $n^2 + n + 2n + 2$ **or** factorises $\frac{1}{2}(n+1)(n+n+2)$ Completes proof with explanation and reference to $(n+1)^2$

6	Statement supported by algebra	B1 M1 A1 C1	writing a general expression for an odd number eg $2n+1$ (dep) for expanding ("odd number")^2 with at least 3 out of 4 correct terms for correct simplified expansion, eg $4n^2 + 4n + 1$ (dep A1) for a concluding statement eg $4(n^2 + n) + 1$ (is one more than a multiple of 4)	Could be $2n - 1$, $2n + 3$, etc Note that $4n^2 + 4n + 2$ or $2n^2 + 4n + 1$ in expansion of $(2n + 1)^2$ is to be regarded as 3 correct terms

7	Proof shown	C2	for complete argument, eg $n(n-1)$ is the product of two consecutive integers and must be even as either n or $n-1$ must be even **or** gives correct reasoning for n odd **and** n even n odd: odd × odd = odd and odd – odd = even n even: even × even = even and even – even = even **or** n odd: $(2n+1)^2-(2n+1)=4n^2+2n=2(2n^2+n)$ n even: $(2n)^2-(2n)=4n^2-2n=2(2n^2-n)$	
		(C1	for factorising, eg $n(n-1)$ **OR** gives correct reasoning for n odd **or** n even **OR** gives a partial explanation using n odd **and** n even, eg odd^2 – odd = even and even^2 – even = even)	

8	Proof	M1	for correct expressions for two consecutive even numbers eg $2n$ and $2n+2$	$(2n)^2+(2n+2)^2$ $=4n^2+4n^2+8n+4$ $=8n^2+8n+4=4(2n^2+2n+1)$
		M1	(dep M1) for expanding both expressions with at least one expansion fully correct eg $4n^2$ and $4n^2+4n+4n+4$ **or** for factorising both terms and intention to square correctly eg $(2n)^2$ and $2^2(n+1)^2$	**Or** $(2n)^2+(2n-2)^2$ $=4n^2+4n^2-8n+4$ $=8n^2-8n+4=4(2n^2-2n+1)$
		A1	complete proof	**Or** $(2n)^2+(2n+2)^2$ $=4(n)^2+4(n+1)^2$ $=4(n^2+(n+1)^2)$