2.

(i) For any $n \in \mathbb{N}$, $\sum_{i=1}^{n}(2i-1) = n^2$.

Proof.

$$\begin{aligned}
\sum_{i=1}^{n}(2i-1) &= \sum_{i=1}^{n}(2i) + \sum_{i=1}^{n}(-1) \\
&= 2\sum_{i=1}^{n} i - \sum_{i=1}^{n} 1 \\
&= 2\frac{n(n+1)}{2} - n \\
&= n(n+1) - n \\
&= n((n+1)-1) \\
\therefore \sum_{i=1}^{n}(2i-1) &= n^2.
\end{aligned}$$

(ii) For any $n \in \mathbb{N}$, $\sum_{i=1}^{n}(2i-1)^2 = \dfrac{n(2n-1)(2n+1)}{3}$.

Proof.

$$\begin{aligned}
\sum_{i=1}^{n}(2i-1)^2 &= \sum_{i=1}^{n}(4i^2-4i+1) \\
&= \sum_{i=1}^{n}(4i^2)\sum_{i=1}^{n}(-4i) + \sum_{i=1}^{n} 1 \\
&= 4\sum_{i=1}^{n} i^2 - 4\sum_{i=1}^{n} i + \sum_{i=1}^{n} 1 \\
&= 4\frac{n(n+1)(2n+1)}{6} - 4\frac{n(n+1)}{2} + n \\
&= 2\frac{n(n+1)(2n+1)}{3} - \frac{3}{3}2n(n+1) + \frac{3n}{3} \\
&= \frac{2n(n+1)(2n+1) - 6n(n+1) + 3n}{3} \\
&= \frac{n\big(2(2n^2+3n+1) - 6(n+1) + 3\big)}{3} \\
&= \frac{n\big(4n^2+6n+2-6n-6+3\big)}{3} \\
&= \frac{n\big(4n^2-1\big)}{3} \\
&= \frac{n\big((2n)^2+2n-2n-1^2\big)}{3} \\
\therefore \sum_{i=1}^{n}(2i-1)^2 &= \frac{n(2n-1)(2n+1)}{3}.
\end{aligned}$$