a) $\sum_{1}^{n} (2i+3)^2$

$= \sum_{1}^{n} (4i^2 + 12i + 9)$

$= 4 \sum_{1}^{n} i^2 + 12 \sum_{1}^{n} i + 9 \sum_{1}^{n} 1.$

$= \frac{4\, n(n+1)(2n+1)}{6} + 12\, \frac{n(n+1)}{2} + 9n$

$= \frac{n}{6} \left(4(n+1)(2n+1) + 36(n+1) + 54 \right)$

$= \frac{n}{6} \left(4(2n^2 + 3n + 2n + 1) + 36n + 36 + 54 \right)$

$= \frac{n}{6} \left(8n^2 + 12n + 4 + 36n + 36 + 54 \right)$

$= \frac{n}{6} \left(8n^2 + 48n + 94 \right)$

$= \frac{n}{3} \left(4n^2 + 24n + 47 \right)$