

$$C \rightarrow \sum_{i=1}^{n-5} \frac{1}{2} (n+i)(n-2i-2) = \frac{1}{2} \sum_{i=1}^{n-5} (n+i)(n-2i-2) =$$

S.P.A

$$= \frac{1}{2} \sum_{i=1}^{n-5} n^2 - 2ni - 2n + ni - 2i^2 - 2i = \frac{1}{2} \left[\sum_{i=1}^{n-5} n^2 - 2n + \sum_{i=1}^{n-5} -ni - 2i + \sum_{i=1}^{n-5} -2i^2 \right]$$

Soma dos n primeiros naturais
 $1^2 + 2^2 + 3^2 + 4^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$

$$= \frac{1}{2} \left[(n-5-1+1)(n^2-2n) + (-n-2)(n-5-1)(n-5) - 2 \cdot \frac{(n-5)(n-4)(2n-9)}{6} \right]$$

$$= \frac{1}{2} \left[(n-5)(n^2-2n) + \frac{(n+2)(n-6)(n-5)}{-2} + \frac{(n-5)(n-4)(2n-9)}{-3} \right]$$

$$= \frac{1}{2} \left[n^3 - 2n^2 - 5n^2 + 10n + \frac{n^3 - 9n^2 + 8n + 60}{-2} + \frac{2n^3 - 27n^2 + 121n - 180}{-3} \right]$$

$$= \frac{-6n^3 + 42n^2 - 60n + 3n^3 - 27n^2 + 24n + 180 + 4n^3 - 54n^2 + 242n - 360}{-12}$$

$$= \frac{n^3 - 39n^2 + 206n - 180}{-12}$$

$$D \rightarrow \sum_{k=1}^{10000} \frac{n^3 - 39n^2 + 206n - 180}{-12} = 10000 \cdot \left(\frac{n^3 - 39n^2 + 206n - 180}{-12} \right)$$

$$= \frac{2500n^3 - 97500n^2 + 515000n - 270000}{-3}$$