

$$\sum_{i=0}^{n-1} \left(i^2 + 1 \right)^2 = \frac{1}{10} n \left(13 - 10 n + 10 n^2 - 5 n^3 + 2 n^4 \right) \sim = \frac{n^5}{5}$$

$$g \left(\frac{n^5}{5} \right) = \Theta \left(g \left(2^n \right) \right)$$