$\sum_{k=1}^{n} k^2(\log k)^3 = \Theta(n^d(\log n)^e)$，求 d, e

求 O：

$$\sum_{k=1}^{n} k^2(\log k)^3 \le \sum_{k=1}^{n} n^2(\log n)^3 = n^3(\log n)^3$$

$$\therefore \sum_{k=1}^{n} k^2(\log k)^3 = O(n^3(\log n)^3)$$

求 Ω：

$$\sum_{k=1}^{n} k^2(\log k)^3 \ge \sum_{k=\frac{n}{2}}^{n} \left(\frac{n}{2}\right)^2\left(\log\frac{n}{2}\right)^3 = \left(\frac{n}{2}\right)^3\left(\log\frac{n}{2}\right)^3$$

$$\therefore \sum_{k=1}^{n} k^2(\log k)^3 = \Omega(n^3(\log n)^3)$$

$$\Rightarrow \sum_{k=1}^{n} k^2(\log k)^3 = \Theta(n^3.(\log n)^3), \quad d=3,\ e=3 \ \text{//}$$