

$$2n^4 + 100n^2 + 1000 \text{ is } O(n^4)$$

$$\leq 4n^4 \text{ for } n > 200.$$

$$\frac{n^{5/3}}{2} \quad \frac{n^2 \cdot 2^n}{4} \quad \frac{n^3}{1} \quad \frac{n^{2n}}{3} \quad 2^{n \log n}$$

$$n = 2^{\log n} \quad 2^a \cdot 2^b = 2^{a+b} \quad (2^a)^b = 2^{a \cdot b}$$

$$2^{5/3 \log n}, \quad n^2 = 2^{2 \log n}$$

$$n^2 \log^2 n = (2^{2 \log n})^{\log^2 n} = 2^{2 \log n \cdot \log^2 n} = 2^{2 \log^3 n}$$

$$n^2 \log^2 n - 2^n = 2^{2 \log^3 n} - 2^n = 2^{n + \log^3 n}$$

$$n \log^3 n = 2^{\log n}$$

$$\log n = 2^{\log \log n} \quad \log^3 n = (2^{\log \log n})^3 = 2^{3 \log \log n}$$

$$n \log^3 n = 2^{\log n + 3 \log \log n}$$

$$n \log n = 2^{\log^2 n}$$