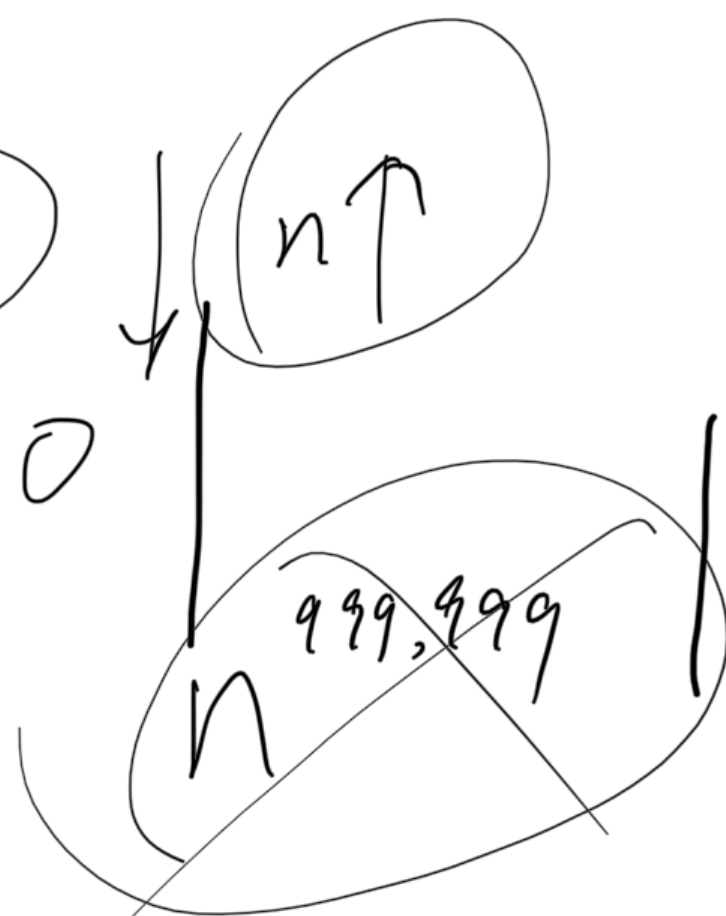




$$5n^3, 100n^2$$

$$\frac{100n^2}{5n^3} = \frac{20}{n}$$



$$T(n) = 32n^2 + 17n + 1$$

$n^{1,000,000}$

$$O(n) \quad 32n^2 + 17n + 1 \leq cn, \quad \forall n \geq n_0$$

$$f(n) = \theta(g(n)) \Leftrightarrow f(n) = O(g), f = \Omega(g)$$

$f = O(g)$

$\Rightarrow$

$$c_1, c_2, n_0$$

$$c_1 g(n) \leq f(n) \leq c_2 g(n) \quad \forall n \geq n_0$$

$$f = \Omega(g)$$

$$\Leftarrow f = O(g) \Rightarrow \exists n_0, c_1, \quad f(n) \leq c_1 g(n) \quad \forall n \geq n_0$$

$$f = \Omega(g) \Rightarrow \exists n_1, c_2, \quad f(n) \geq c_2 g(n) \quad \forall n \geq n_1$$

$$n_2 = \max(n_0, n_1)$$

$$f = \theta(g)$$

$$c_2 g(n) \leq f(n) \leq c_1 g(n), \quad \forall n \geq n_2?$$

