

What is the time complexity of,  $f(n) = n^3 + n^2 + n + 4$

What is the time complexity of given function,

$$f(n) = n^3 + n^2 + n + 4 ?$$

**Solution:**

Given,

$$f(n) = n^3 + n^2 + n + 4$$

- $f(n) \geq n^3 + n^2 + n + 4$
- $f(n) \geq n^3 + n^2 + n$ , for all  $n \geq 1$
- $f(n) \geq n^3 + n^2$ , for all  $n \geq 1$
- $f(n) \geq n^3$ , for all  $n \geq 1$

Compare with the standard Big omega notation equation that is,

$$f(n) \geq c \cdot g(n), \text{ for all } n \geq n_0$$

Here,

$$g(n) = n^3,$$

$$c = 1$$

$$n_0 = 1$$

- $f(n) = \Omega(g(n))$
- $f(n) = \Omega(n^3)$