Exist c_1, c_2, and n_0 that $\Theta(g(n)) = \{f(n) : 0 \leq c_1 g(n) \leq f(n) \leq c_2 g(n)\}$ for all $n \geq n_0$

Exist c_1, c_2, and n_0 that $o(g(n)) = \{f(n) : 0 \leq f(n) < cg(n)\}$ for all $n \geq n_0$

For Example: $2n^2 = O(n^2)$, but $2n^2 \neq o(n^2)$.

$f(n) = \omega(g(n))$ if and only if $g(n) = o(f(n))$

Because $\Theta(g(n))$ is a set, $f(n) \in \Theta(g(n))$, but we always write $f(n) = \Theta(g(n))$.

Property:

1.Transitivity: $f(n) = \Theta(g(n))$ and $g(n) = \Theta(h(n))$ then $f(n) = \Theta(h(n))$

2.Reflexivity: $f(n) = \Theta(f(n))$

3.Symmetry: $f(n) = \Theta(g(n))$ if and only if $g(n) = \Theta(f(n))$

4.Transpose Symmetry: $f(n) = \Theta(g(n))$ if and only if $g(n) = \Omega(f(n))$

$f(n) = o(g(n))$ if and only if $g(n) = \omega(f(n))$

$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} ... = \sum_{i=0}^{\infty} \frac{x^i}{i!}$

$1 + x \leq e^x \leq 1 + x + x^2$

Fibonacci: $F_i = \frac{\rho^i - \bar{\rho^i}}{\sqrt{5}}$

ρ is golden ratio F_i equal to $\frac{\rho^i}{\sqrt{5}}$ rounded to the nearist integer