

Asymptotic Bounds

$f(x)$ is

$O(g(x))$ if $\exists c$ and $x_0 \ni |f(x)| < cg(x) \forall x > x_0$

$\Omega(g(x))$ if $\exists \epsilon > 0$ and infinite $S \subseteq \mathbb{N} \ni |f(x)| > \epsilon g(x) \forall x \in S$

$\Theta(g(x))$ if $\exists c_1 > 0, c_2 > 0$ and $x_0 \ni c_1g(x) < |f(x)| < c_2g(x) \forall x > x_0$

$o(g(x))$ if $\lim_{x \rightarrow \infty} f(x)/g(x) = 0$

$\sim (g(x))$ if $\lim_{x \rightarrow \infty} |f(x)/g(x)| = 1$