\[ g(x) = 100x^2 + 20x + 3500 \]

\[ f(x) = x^3 - 2000x^2 \]

Is \( g(x) = f(x) \)?
\[ f(x) \geq g(x) \quad \text{for all} \quad x > a \]
\( O, \Omega, \Theta \) notation

For functions \( f \) and \( g \)

If for sufficiently large values \( x \),
the values of \( f \) are less than
those of a multiple of \( g \)

\( f \) is order at most \( g \),
or \( f(x) \) is \( O(g(x)) \)

\[ f(x) \text{ is } O(g(x)) \text{ iff } \exists B, b \in \mathbb{R}^+ \text{ s.t. } |f(x)| \leq B |g(x)| \text{ for all real numbers } x > b. \]
\[ \Omega \]

If for sufficiently large values of \( x \), the values of \( |f| \) are greater than some multiple of \( |g| \),

\( f \) is of order at least \( g \) or

\( f(x) \) is \( \Omega(g(x)) \)

\( f(x) \) is \( \Omega(g(x)) \) iff

\[ \exists A, a \in \mathbb{R}^+ \text{ s.t. } \\
A \cdot |g(x)| \leq |f(x)| \]

\[ \forall x \geq a \left| \frac{f(x)}{g(x)} \right| \leq A \cdot |g(x)| \]
\( f \) is order \( g \)

\( f(x) \) is \( \Theta(g(x)) \)