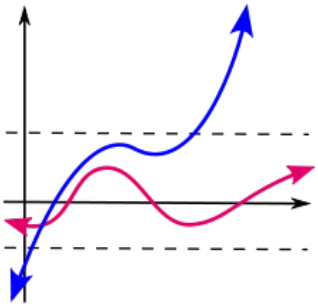
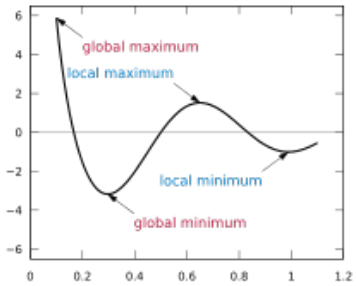
Basic Definitions of Function Properties

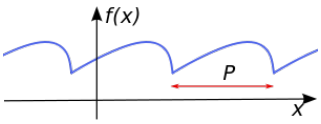
one-to-one	$\forall x_1, x_2 \in D_f: \quad x_1 \neq x_2 \Rightarrow f(x_1) \neq f(x_2)$
increasing on an interval I	$\forall x_1, x_2 \in I: \quad x_1 < x_2 \Rightarrow f(x_1) < f(x_2)$
decreasing on an interval I	$\forall x_1, x_2 \in I: \quad x_1 < x_2 \Rightarrow f(x_1) > f(x_2)$
odd	$\forall x \in D_f: \quad f(-x) = -f(x)$
even	$\forall x \in D_f: \quad f(-x) = f(x)$
bounded above by A, below by B	$\exists A, B \in \mathbb{R}\ \forall x \in D_f: \quad A \geq f(x) \geq B$
maximum M on an interval I	$\exists M \in \mathbb{R}\, \forall x \in I: \quad f(x) \leq M$
minimum m on an interval I	$\exists m \in \mathbb{R}\, \forall x \in I: \quad f(x) \geq m$
periodic with period P	$\exists P \in \mathbb{R}\ \forall x \in D_f: \quad f(x) = f(x+P)$



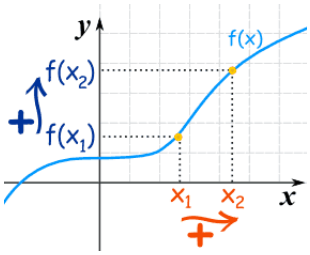
A bounded and unbounded function.



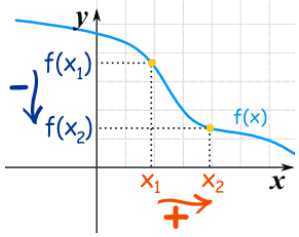
Extrema (max and min) of a function.



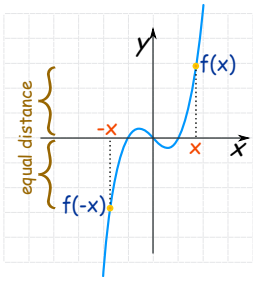
A periodic function.



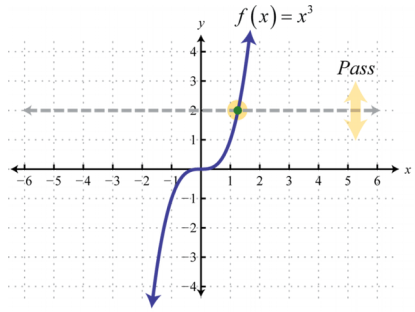
An increasing function.

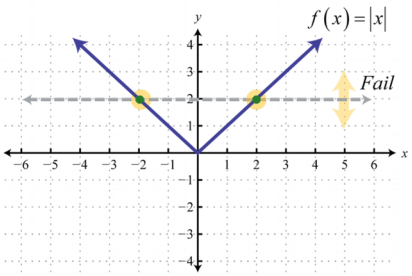


A decreasing function.

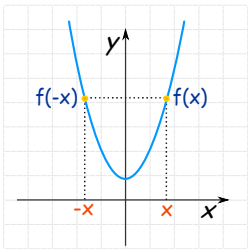


An odd function.





How to examine whether a function is one to one.



An even function.