

MATH 171 CALCULUS I

DR. McLOUGHLIN'S HANDY DANDY GUIDE TO DEFINITION OF PARTICULAR TYPES OF FUNCTIONS

Definition 1: A function, $f, f: D \rightarrow C$ is even iff
for every $x \in D, f(-x) = f(x)$

Definition 2 A function, $f, f: D \rightarrow C$ is periodic iff
there exists a $k > 0$ such that for every $x \in D, f(x + k) = f(x)$

Definition 3: A function, $f, f: D \rightarrow C$ is increasing iff
for every x_1 and x_2 in $D, x_1 < x_2 \Rightarrow f(x_1) < f(x_2)$

Definition 4: A function, $f, f: D \rightarrow C$ is non-increasing iff
for every x_1 and x_2 in $D, x_1 < x_2 \Rightarrow f(x_1) \geq f(x_2)$

Definition 5: A function, $f, f: D \rightarrow C$ is decreasing iff
for every x_1 and x_2 in $D, x_1 < x_2 \Rightarrow f(x_1) > f(x_2)$

Definition 6: A function, $f, f: D \rightarrow C$ is non-decreasing iff
for every x_1 and x_2 in $D, x_1 < x_2 \Rightarrow f(x_1) \leq f(x_2)$

Definition 7: A function, $f, f: D \rightarrow C$ is constant iff
for every x_1 and x_2 in $D, x_1 < x_2 \Rightarrow f(x_1) = f(x_2)$

Definition 8: A function, $f, f: D \rightarrow C$ is injective iff
for every x_1 and x_2 in $D, f(x_1) = y \wedge f(x_2) = y \Rightarrow x_1 = x_2$

Definition 9: A function, $f, f: D \rightarrow C$ is surjective iff for every y in C there exists an x in D such
that $f(x) = y$

Definition 10: The number L is the limit of the function $f: A \rightarrow B$ at $a \in A$ iff for every $\varepsilon > 0$ there
exists a $\delta > 0$ such that $|f(x) - L| < \varepsilon$ whenever $x \in A$ and $|x - a| < \delta$.

Definition 11: A function $f: A \rightarrow B$ is continuous at $a \in A$ iff for every $\varepsilon > 0$ there exists a $\delta > 0$
such that $|f(x) - f(a)| < \varepsilon$ whenever $|x - a| < \delta$.

Definition 12: A function $f: A \rightarrow B$ is uniformly continuous on the set $C \subseteq A$ at $a \in A$ iff for every
 $\varepsilon > 0$ there exists a $\delta > 0$ such that $|f(x) - f(y)| < \varepsilon$ whenever $x \in C, y \in C,$ and $|x - y| < \delta$.