Continuity

f is continuous at a if

$$\lim_{x \to a} f(x) = f(a).$$

"DSP works"

continuous on $[a,b)$

Continuous on its domain

polynomials rational functions
roots trig logs exp
sums products
Compositions

Intermediate Value theorem

if f is continuous on $[a,b]$

and $f(a) \le N \le f(b)$, then there is

$c \in [a,b]$ such that $f(c) = N$.

ex. Show that there is a real number that is one more than its cube

$x = x^3 + 1$ $\quad 0 = x^3 - x + 1$

$f(x) = x^3 - x + 1$

$f(0) = 1$

$f(-2) = -8 + 2 + 1 = -5$