3.5 Properties of Continuous Functions

Intermediate Value Theorem

Suppose f is continuous on the closed interval $[a,b]$ and let N be any number strictly between $f(a)$ and $f(b)$. Then there exists a number c in (a,b) such that $f(c)=N$.

Example: Use the Intermediate Value Theorem to show there is a root of the given equation in the given interval.

a) $x^5-2x^4-x-3=0, \quad (2,3)$

b) $x^2=\sqrt{x+1}, \quad (1,2)$

Example: Use the Intermediate Value Theorem to show that there is a positive number c such that $c^2=2$.