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

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

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