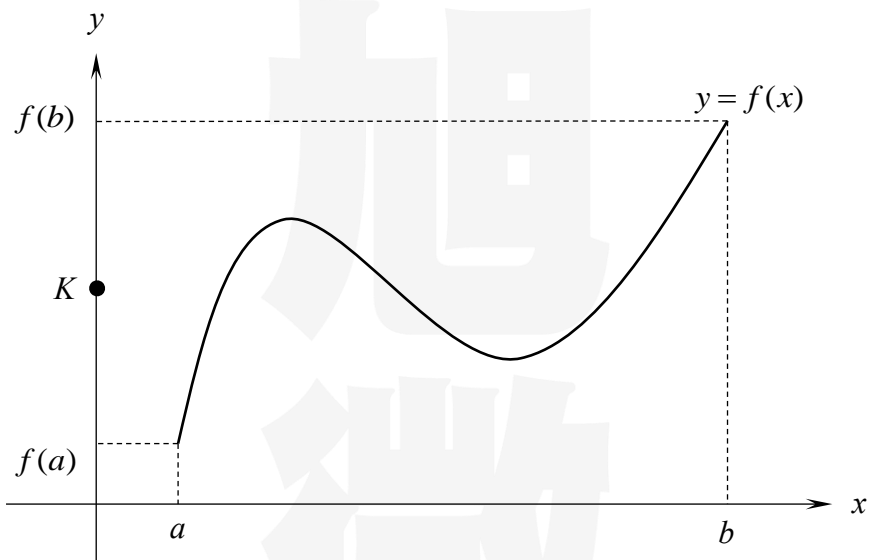


重點四 連續函數的中間值定理

1. 設 $f(x)$ 為一在 $[a,b]$ 上的連續函數。

若 K 為一個介在 $f(a)$ 和 $f(b)$ 之間的實數的話，

則：



2. 此定理目前無法證明。欲知如何證明者，請參考高等微積分用書。

例題 1.

For $f(x) = x^2 + x - 1$ on $[0,5]$ and $f(c) = 11$, verify that the Intermediate Value Theorem applies to the indicated interval and find the value of c guaranteed by the theorem.

解

例題 2. (精選範例 4-1)

Let $f(x)$ be continuous on $[a, b]$. Suppose that $f(a) \cdot f(b) < 0$. Show that $f(x)$ must have at least one root in $[a, b]$.

解

例題 3. (精選範例 4-2)

Let $f(x)$ be continuous on $[0, 1]$ and $0 \leq f(x) \leq 1$ for all $x \in [0, 1]$. Show that there must be some number $c \in [0, 1]$ such that $f(c) = c$.

解