1

Give an example of a function f such that:

- f is defined everywhere on $[0, 1]$,
- f has a local maximum in the interval $[0, 1]$,
- f has *no* local minimum in the interval $[0, 1]$,
- f has a global maximum in the interval $[0, 1]$,
- f has *no* local minimum in the interval $[0, 1]$.

2

Give an example of a function f such that:

- f is defined everywhere on $[0, 1]$,
- f has a local maximum in the interval $(0, 1)$,
- f has *no* local minimum in the interval $[0, 1]$,
- f has a global maximum in the interval $[0, 1]$, and this maximum is neither 0 nor 1,
- f has *no* local minimum in the interval $[0, 1]$.

3

Give an example of a function f such that:

- f is defined everywhere on $[0, 1]$,
- f has local maxima at both 0 and 1,
- f has no local extrema in $(0, 1)$,

4

Give an example of a function f such that:

- $f(0) = -1$,
- $f(1) = 1$,
- f is continuous on $(0, 1)$,
- There is no c in $(0, 1)$ such that $f(c) = 0$

5

Give an example of a function f such that:

- $f(0) = f(1) = 0$,
- f is continuous on $[0, 1]$,
- There is no c in $(0, 1)$ such that $f'(c) = 0$

6

Give an example of a function f such that:

- $f(0) = f(1) = 0$,
- f is continuous on $(0, 1)$,
- f is differentiable on $(0, 1)$,
- There is no c in $(0, 1)$ such that $f'(c) = 0$

7

Give an example of a function f such that:

- $f(0) = 0$,
- $f(1) = 1$,
- f is continuous on $[0, 1]$,
- There is no c in $(0, 1)$ such that $f'(c) = 1$

8

Give an example of a function f such that:

- $f(0) = 0$,
- $f(1) = 1$,
- f is continuous on $(0, 1)$,
- f is differentiable on $(0, 1)$,
- There is no c in $(0, 1)$ such that $f'(c) = 1$