Math 135, Calculus 1, Fall 2020

Weekly Quiz 11-18

Show all work: clearly indicate your answer and the reasoning used to arrive at the answer. Unsupported answers may not receive full credit.

Problem 1. Consider the function $f(x) = 6x - x^2$.

(a) Use calculus to find the critical point(s) of $f(x)$.

$f'(x) = 6 - 2x \doteq 0$

$2x = 6$

$\boxed{x = 3}$

(b) Use calculus to compute the absolute maximum and minimum values of $f(x)$ on $[0, 5]$.

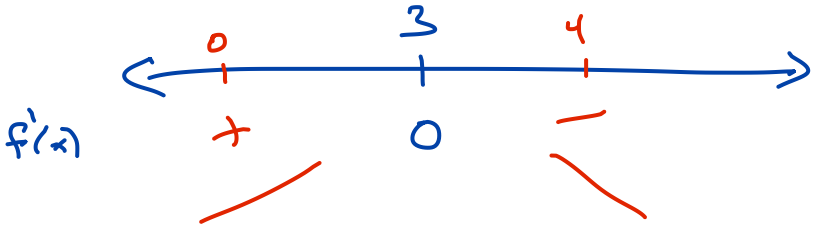
EVT: CPs & Endpoints

$f(3) = 6(3) - (3)^2 = 18 - 9 = \boxed{9}$ Absolute max value

$f(0) = 6(0) - (0)^2 = \boxed{0}$ Absolute min value

$f(5) = 6(5) - (5)^2 = 30 - 26 = 5$

(c) Use calculus to find the intervals where $f(x)$ is increasing or decreasing.



$f'(0) = 6 - 2(0) > 0$

$f'(4) = 6 - 2(4) < 0$

- Increasing on $(-\infty, 3)$
- Decreasing on $(3, \infty)$