

MITx 6.86x

Machine Learning with Python-From Linear Models to Deep Learning

Discussion Course <u>Progress</u> <u>Dates</u> **Resources**

Course / Unit 0. Brief Prerequisite Reviews, Homework 0, and Project 0 / Homework 1

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3. Function Properties

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Homework0 due Feb 8, 2023 08:59 -03 Completed

Asymptotics and Trends

3.5/4.0 points (graded)

For each of the following functions $f\left(x
ight)$ below :

- Find its limits $\lim_{x \to \pm \infty} f(x)$ as x approachs $\pm \infty$.
- ullet Choose the values of x where $f\left(x
 ight)$ is differentiable, i.e. $f'\left(x
 ight)$ exists
- ullet Choose the values of x where $f\left(x
 ight)$ is also strictly increasing, i.e. $f^{\prime}\left(x
 ight) >0.$
 - 1. For $f(x) = \max(0, x)$:

(Recall the function $\max (0, x)$ is the function that outputs the maximum value each x.)

(If the limit diverges to infty, enter \inf for ∞ , and \inf for $-\infty$)

$$\lim_{x \to -\infty} f(x) = 0$$

$$\lim_{x o +\infty} f\left(x
ight) =$$
 inf inf

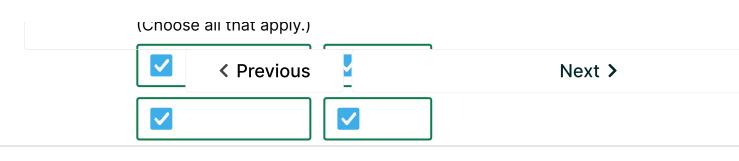
Choose the intervals of $oldsymbol{x}$ where

$$f\left(x
ight)$$
 differentiable: $f'\left(x
ight) >0$:

(Choose all that apply.)

$$\begin{array}{c|c} \checkmark & x < 0 \\ \hline \checkmark & x < 0 \\ \hline \checkmark & x = 0 \\ \hline \checkmark & x > 0 \\ \hline \end{array}$$

(Graph this function on a piece of paper!)





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