Exercises 2.5

Exercise 2.5.1

a. Show that the logistic function σ satisfies the inequality $0 < \sigma'(x) \leq \frac{1}{4}$, for all $x \in \mathbb{R}$.

b. How does the inequality changes in the case of the functions σ_c?

Exercise 2.5.2

Let $S(x)$ and $H(x)$ denote the bipolar step fucntion and the Heaviside function,respectively. Show that:

a. $S(x) = 2H(x) - 1$

b. $ReLU(x) = \frac{1}{2}x(S(x) + 1)$