

Instructions: Show Your Work!

1. (3 pts) Find the absolute maximum and absolute minimum values of the function

$$f(x) = \cos^2(x) - \cos(x) \quad \text{on the interval} \quad [-\pi/2, \pi].$$

2. (3 pts) Find the interval(s) where the graph of the function

$$f(x) = x \ln x$$

is increasing and the interval(s) where it is decreasing.

3. (4 pts) Show that the equation

$$x^3 - 15x + 1 = 0$$

has at most one root in the interval $[-2, 2]$.
