**MATH 2554** **Calculus I** **Fall 2019**

Drill Handout Sections 2.6, 2.7, and 3.1 September 17, 2019

Name:_____

(1) Use the Intermediate Value Theorem to show that $x \ln x - 1 = 0$ has a solution on the interval $(1, e)$.

(2) Let $f(x) = \begin{cases} \frac{x}{2} + 3 & \text{if } x \leq 2 \\ 2x & \text{if } x > 2 \end{cases}$. For $\varepsilon = 1$ and $\varepsilon = 0.5$, find all values of $\delta > 0$ such that $|f(x) - 2| < \varepsilon$ whenever $0 < |x - 2| < \delta$.

(3) Use the definition to find the slope of the tangent line to the graph of $f(x) = \frac{3}{x+1}$ at the point $P = (2, 1)$.