1. (6 pts) Find the derivative of the function.

(a) $y = x\,e^{-x}$ (b) $y = \ln(\ln x)$

2. (6 pts) Use **logarithmic differentiation** to find the derivative of the function.

$$y = \frac{x\,(1 - 2x)^3}{\sqrt{x^2 + 1}}$$

3. (8 pts) Use the **Closed Interval Method** to determine the absolute extreme values of

$$f(x) = x^3 - 3x^2 + 2, \text{ on the interval } [-1, 1].$$