

November 5, 2020

MAC 2311  
Quiz 9

**Remember to show all of your work.**

**Problem 1.** Let  $f(x) = x^3 e^x$

- (a) Find all critical points of  $f(x)$ .
- (b) Determine the intervals on which  $f(x)$  is increasing or decreasing.
- (c) Find all potential inflection points of  $f(x)$ .

**Problem 2.** For each part below, answer "yes" or "no" and provide a short(!) explanation why.

- (a) Does the Mean Value Theorem hold for  $f(x) = \cos(x) \ln(x)$  on the interval  $[0, 2\pi]$ ?
- (b) Does Rolle's Theorem hold for  $f(x) = x - \frac{1}{x}$  on the interval  $[1, 2]$ ?