Math 425: Collected Homework 5, due in lab, 10/12

Fall 2021

Directions: This homework is due on 10/5 at the start of your lab. Late work will not be accepted. Each homework will be worth 10 points, and at least ONE of these points is awarded for "professionalism", meaning that your work is prepared suitably, according to the guidelines below.

- Write your name and lab number at the top of your work.
- Label each problem clearly.
- Make sure that your work is clear. Show your work to gain full credit.
- Do not submit torn or sloppy paper.
- Leave blank space for comments from the grader.
- Staple your work.

1. Find the equation of the tangent line for the function $f(x) = e^x$ at $x = \ln(2)$.
2. Find all x for which the tangent line for $g(x) = x - \cos(x)$ is horizontal.
3. Given $f(x) = xe^x$.
   - (a) Compute $f'(x)$.
   - (b) Compute $f''(x)$.
   - (c) Make a guess for $f^{(5)}(x)$. In one sentence explain how parts (a) and (b) suggest your guess.
4. Use class methods to compute the limit. Your answer is a finite number, "DNE", ∞ or $-\infty$.

$$\lim_{x \to 5} \frac{x-6}{5-x}$$

   You will receive no credit on this problem if you create a table of values or if you substitute, say, $x = 5.001$. See the post entitled "Math425-0-in-denom" at canvas for correct arguments.