Math 31B
Homework 2
Due Thursday, January 26, 2023

Instructions: Show all work that was done to arrive at your answer. Answers with no work will not receive credit. Use full sentences when necessary.

Do the following problems from each section of the textbook:

- 7.5: 38,44,48,50
- 7.6: 60,82,83,108
- Chapter 7 Review: 107,108
- 8.1: 18,24,35,36,44,82

Do the following additional problems:

1. (a) Explain why L'Hopital's rule does not apply to $\lim_{x\to 0} \frac{\frac{1}{x}+xe^x}{e^x-1}$. Compute the limit using an alternate method.
   (b) Explain why L'Hopital's rule does not apply to $\lim_{x\to\infty} \frac{x}{x+\sin(x)}$. Compute the limit using an alternate method.
   (c) Consider the expression $\lim_{x\to\infty} \frac{x}{\sqrt{x^2+1}}$. Try to evaluate this limit using L'Hopital's rule. What goes wrong? Compute the limit using an alternate method.