Homework 3

Math 171H (section 201), Fall 2023

This homework is due on **Tuesday, September 5** at the start of class. (Turn in your answers to questions 1–7.)

0. Read Section 1.5.
   (a) Is every function whose graph is a line with slope 6, one-to-one?
   (b) Does $f(x) = |x|$ have an inverse function? Explain.
1. How are you feeling (in general OR in this class OR etc.) at this point in the semester? Answer this question in **one** of the following ways: (a) a paragraph, (b) a poem or picture, (c) a video (emailed to the instructor), or (e) one or more slides – e.g. made using Powerpoint, Google slides, or Beamer (emailed to the instructor)
2. Give an example of a vector-valued function for which the corresponding parametric curve is:
   (a) a circle of radius 100.
   (b) (more or less) a figure-eight.
3. (a) Is there a function $f(x)$ for which the inverse function is $f^{-1}(x) = f(x)$?
   (b) Is there a function $f(x)$ for which the inverse function is $f^{-1}(x) = \frac{1}{f(x)}$?
   (c) Is there a function $f(x)$ for which the inverse function is NOT $f^{-1}(x) = \frac{1}{f(x)}$?
   (d) (OPTIONAL) Make a meme that warns students not to confuse (the inverse function) $f^{-1}(x)$ with $\frac{1}{f(x)}$.
4. Compute the following:
   (a) $\arcsin(-1)$
   (b) $\arccos(-\sqrt{3}/2)$
5. Find a formula for $\cos(\arcsin(x))$, and verify your answer.
6. Are there any values of x for which $\arcsin x = \frac{1}{\sin x}$? How many? Justify your answers.
7. Do one of the following:
   (a) (Option 1) Skim Chapter 1, and list all topics you have NOT covered in a previous math class.
   (b) (Option 2) Read the review questions on pages 68—79, and list all concepts you encountered that you have NOT covered in a previous math class.