Calc I - Rehash Review

Most of us are going to have a second go at a few fundamentals this Friday, March 21 - let's call it our "Exam 2 Rehash". All the problems on that rehash will look something like something here.

If you have a pretty solid A in the class (I will let you know), then you don't need to do the rehash and have most of the rest of the week off from calculus. If so, you are welcome to

- Let me know, if you've got some old HWs you need points on and/or
- Take a look at this challenge probem.

Most of, though, will go over this sheet on Wednesday and you will try the rehash on Friday. If that includes you, then *please* take this review sheet as seriously as you would a review sheet for an exam.

1. The rehash will have exactly 3 differentiation problems; here are a few to whet your appetite:

   a. $f(x) = 3x^2 + 5x - \sqrt{x} + \frac{1}{x}$

   b. $f(x) = (x^2 + 2x)e^{-x}$

   c. $f(x) = e^x + \sin(x^4)$

   d. $f(x) = (3x^2 + 4x + 1)^5$

   e. $f(x) = (x^3 + 2x + 5)\sin(2x)$

   f. $f(x) = \dfrac{x^2 + 1}{x^2 + 4}$

   g. $f(x) = e^{-x}\sin(x)(x^3 + 3x + 1)^4$

2. There will be a problem with a graph asking you to find the locations and/or the values of the extremes; something like so:
   The graph of $f(x) = (x^2 - 1)e^x$ restricted to the interval $[-1, 1]$ is shown in figure 1. Find the exact *locations* (i.e., the x-coordinates) of any absolute maxima and minima of f over that interval.
   Comments:

   - Read the question and make sure to clearly answer that question.
   - The graph is there to help; please use it.

3. Figure 2 shows the graph of $f(x) = 2x^3 + x - 3$ together with the dashed line $y = x$.

   a. Sketch the graph of f^{-1} on the same set of axes.
   b. Find an equation for the line that is tangent to the graph of f^{-1} at the point where $x = -1$.

Figures

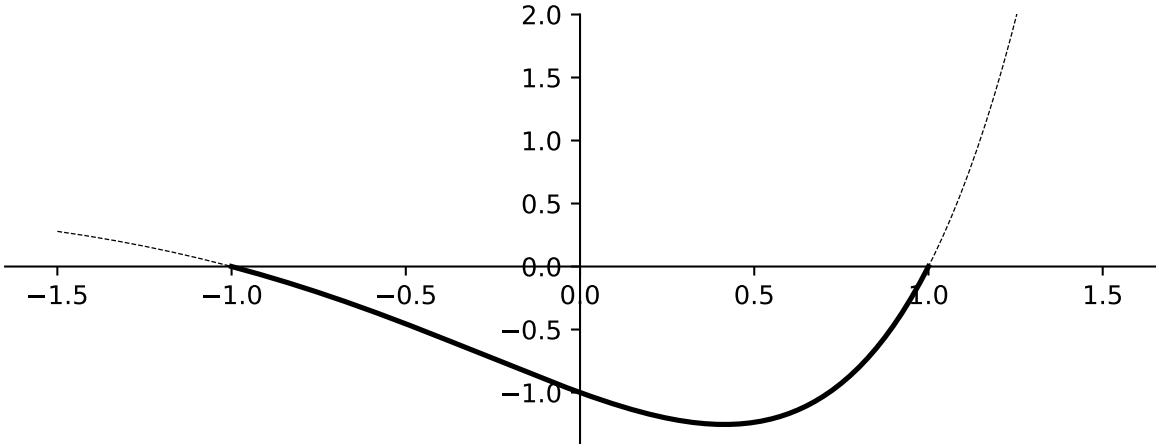

Figure 1: Plot of a function

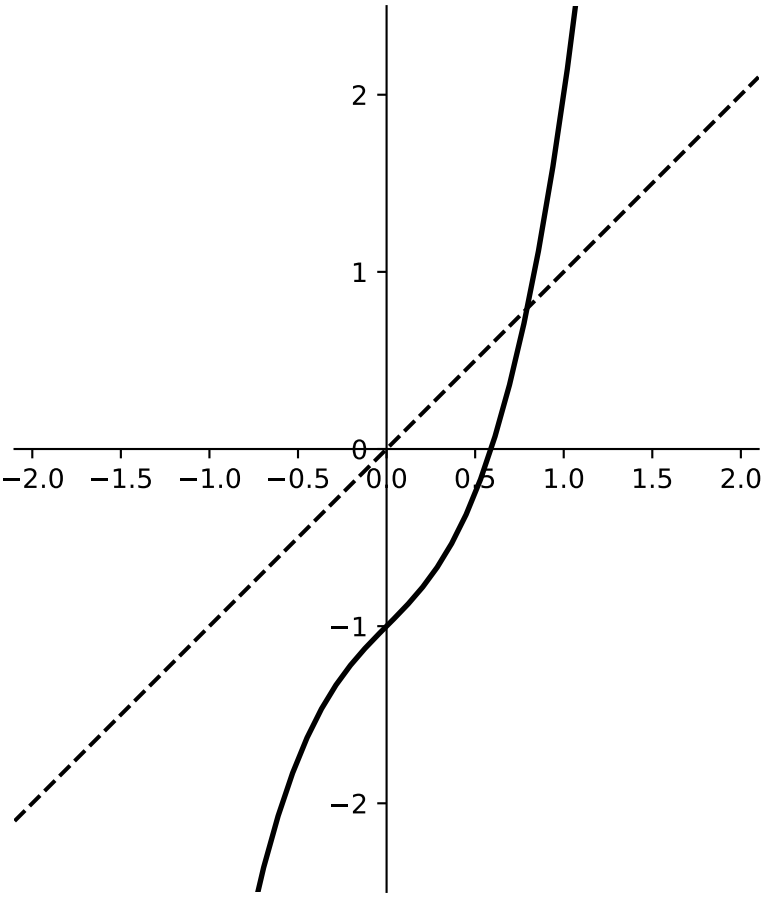

Figure 2: Plot of a $1-1$ function