Calculus I lecture notes

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08-25-08

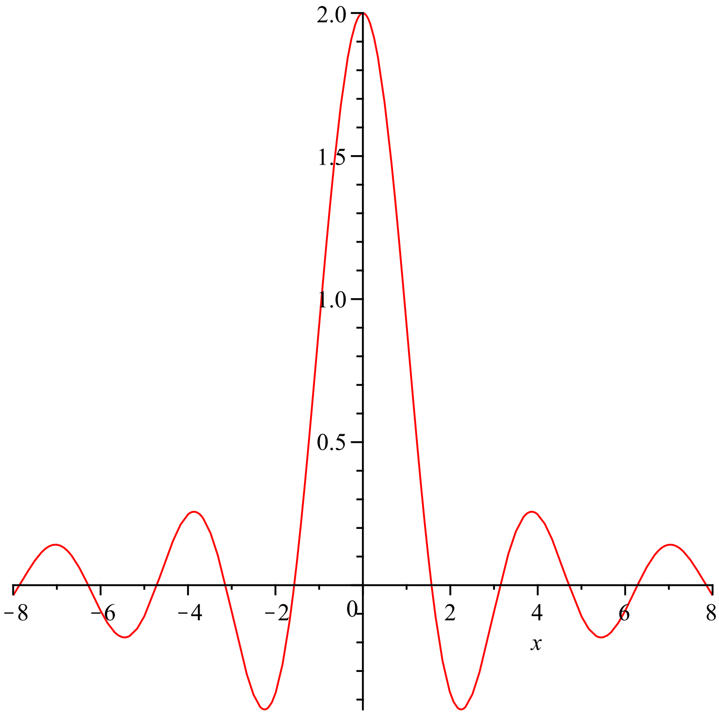

Figure 1: The graph of the function $\frac{\sin 2x}{x}$.

08-27-08

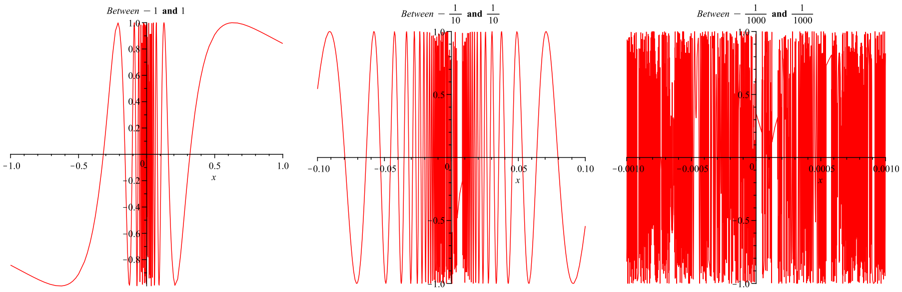

Figure 2: The graph of the function $\sin \frac{1}{x}$.

09-03-08

Here we give an example where we combine a bunch of random continuous functions together using the rules on pages 86-88 which preserve continuity to get a continuous function.

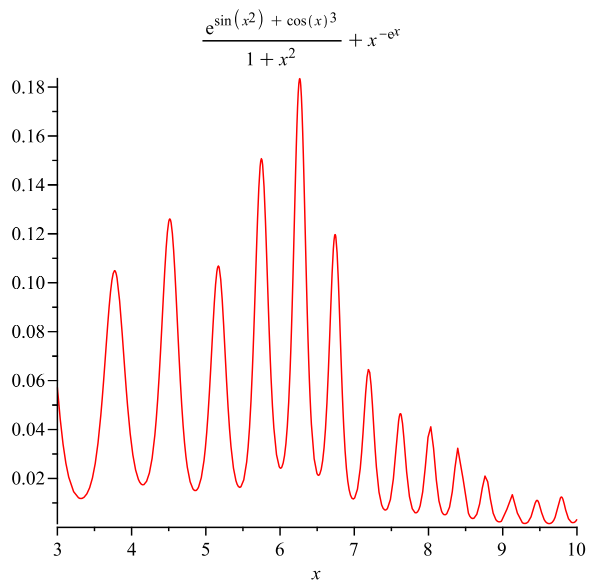

Figure 3: The graph of the function in the caption between 3 and 10.

Assigned homework from page 90: 2,5 (prelim section!), 2,3,8,12,22,37,80.

09-08-08

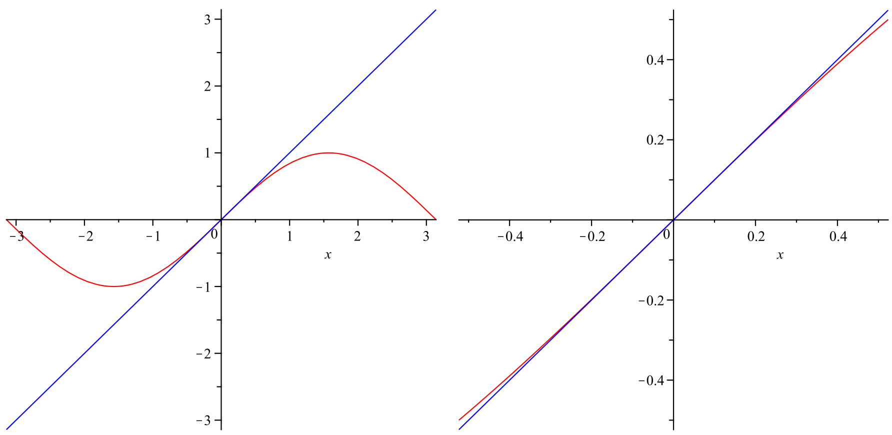

Figure 4: Comparison of the graphs $\sin x$ and x.

09-12-08

The real root of the polynomial $x^3 + 2x - 1$ is exactly equal to

$$\frac{1}{6}\sqrt[3]{108 + 12\sqrt{177}} - \frac{4}{\sqrt[3]{108 + 12\sqrt{177}}}.$$

This number is approximately 0.4533976522. In class we used the intermediate value theorem (and no calculator) to show that the root was between $7/16 = 0.4375$ and $15/32 = 0.46875$.

09-15-08

The following graph plots the $\sin(x)$ and x.

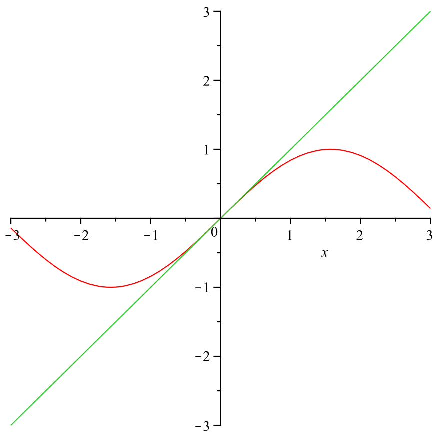

Figure 5: Comparison of the graphs $\sin x$ and x.

A note on homework: it seems that the homework for this section has not been posted by the course organizer. He has told me that it will be posted before the end of 9/16/08.

09-19-08

The following graph plots a^x for $a = 1, 2, 3, 4, 5$, and 6.

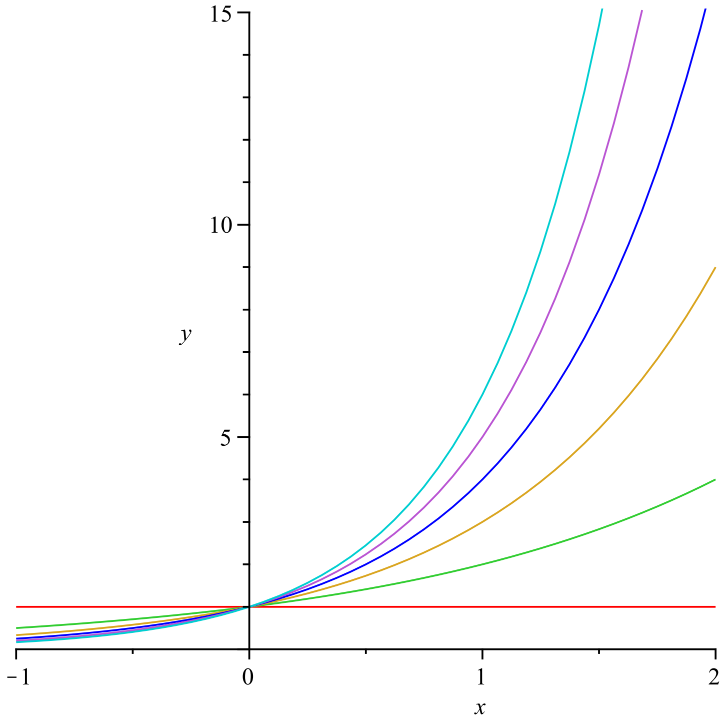

Figure 6: Graphs of several exponential functions

09-19-08

The homework due 10-6-08 is 3.6 1,2,3,4,10,12,14,16,18 and 3.7 9,10,16,17,19,41,43,68.

09-30-08

The graph of $\ln(x)$.

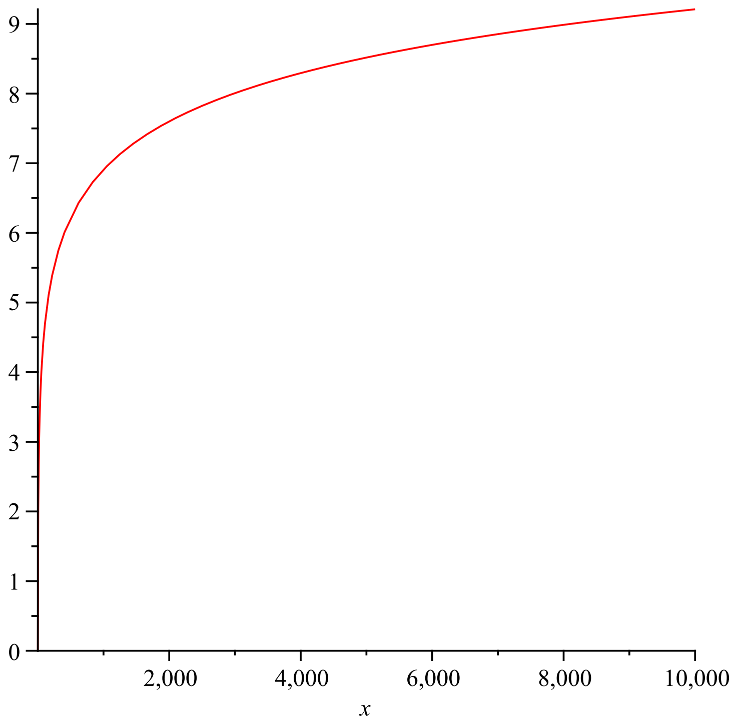

Figure 7: $\ln(x)$ plotted from 1 to 10000

11-4-08

Notice how the graph goes through e as x goes to 0.

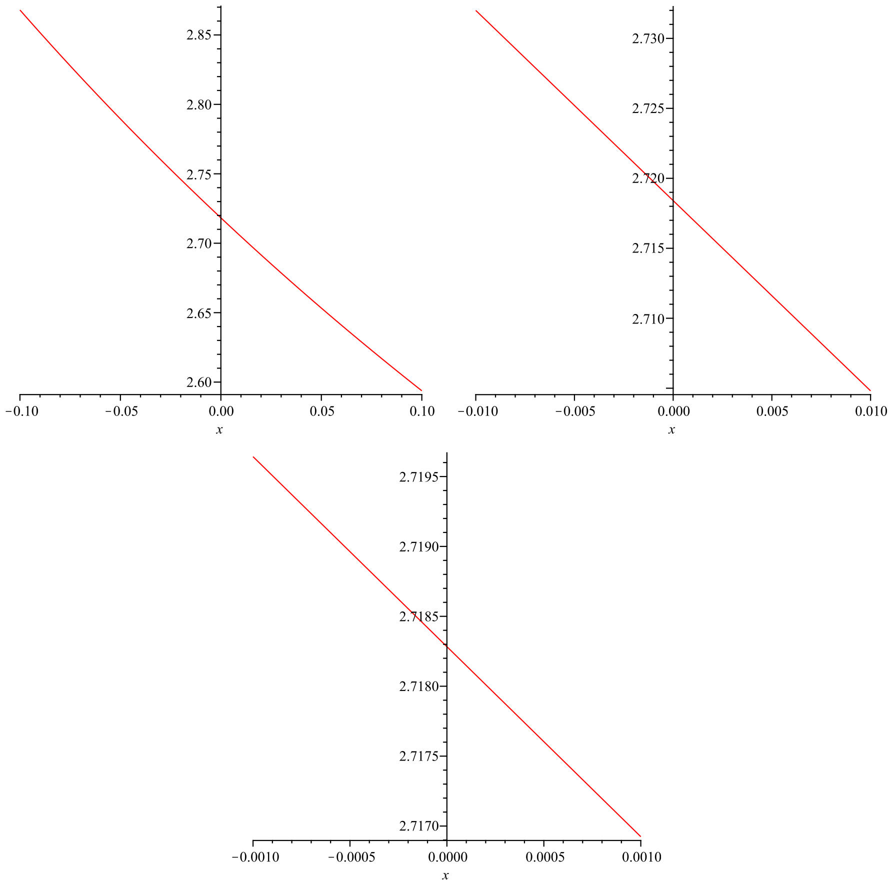

Figure 8: $(1+x)^{1/x}$ plotted from -1/10 to 1/10, -1/100 to 1/100 and -1/1000 to 1/1000 resp.

11-7-08

Newton's Method in pictures through 3 iterates. The red graph is the actual graph.

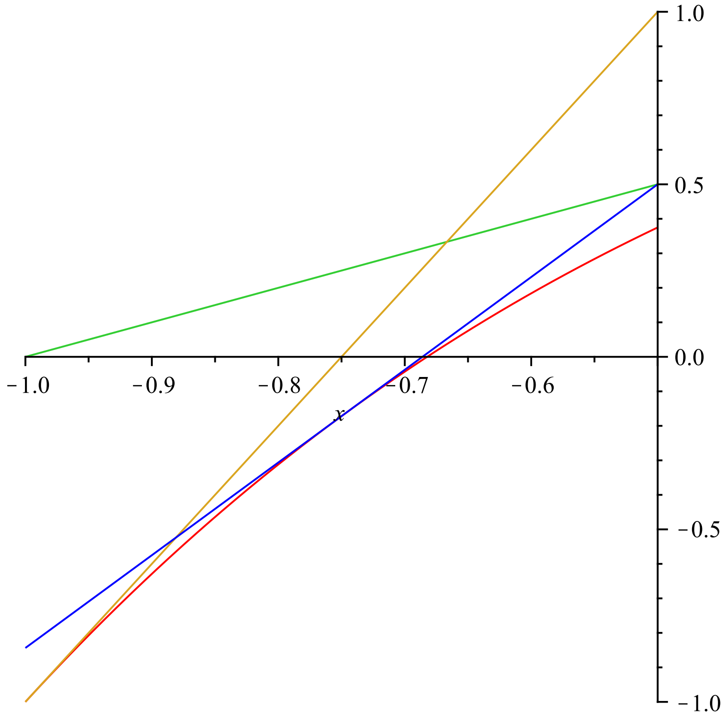

Figure 9: Newton's Method Used to Approx the real root of $x^3 + x + 1$.