Recitation 1 MA113:004–006
27 August 1998 Fall 1998

Below are a selection of problems over section 1.1 and section 1.3 on graphing calculators. You should form groups of 3 to 5 and begin work on these problems. The teaching assistant will be available to answer questions as they arise. You should finish all of these problems. This will probably require time outside of class. These problems will not be collected or graded.

1. Work problems 1, 2, 5, 7, 21, 23, 43, 45, 49, 51 from section 1.1 of Stewart.

2. Using your graphing calculator, graph the functions

$$\begin{aligned} f(x) &= x^2 \\ g(x) &= (x-1)^2 + 2 \end{aligned}$$

in the same window. How are the graphs the same? How are they different?

3. Using your graphing calculator, graph the functions

$$\begin{aligned} f(x) &= \sin(x) \\ f(x) &= \sin(2x) \\ h(x) &= 2\sin(x) \end{aligned}$$

in the same window. How are the graphs the same? How are they different?

4. Graph the function

$$f(x) = \sin(75x)$$

for $-2 \le x \le 2$. Now make a small change in the window, say $-1.9 \le x \le 2$. What happens to the graph? Do you think the graphs are right? Why does the TI-82 have problems with this function?

5. For the following exercises, you are to graph a parametric curve. To do this on the TI-82, touch the `mode` key, push the down arrow three times until you reach the line with `Func Par Pol Seq`, touch the left or right arrows to select `Par` and touch the `Enter` and then `2nd, Quit`. Now to graph a parametric curve, touch the `Y=` key, and enter the expressions below for $x(t)$ and $y(t)$. Finally, touch the `Window` key to adjust the interval for t and the `Graph` key to draw the curve.

   (a) Graph circle of radius 2.

$$x(t) = 2\cos t, \qquad y(t) = 2\sin(t), \qquad 0 \le t \le 2\pi.$$

   Does the circle look round? How can you adjust the window to make the circle look like a circle?

(b) Graph the parametric curve

$$x(t) = 2\cos(-t), \qquad y(t) = 2\sin(-t).$$

How does this compare with the curve in the previous question?

(c) Graph the curve

$$x(t) = 2\cos(t), \qquad \sin(2t), \qquad 0 \le t \le \pi$$

What happens if you increase the interval for t?

6. Stewart, section 1.3 #17 and #23. For #17, you might graph the left hand side of the equation and then use the `root` entry on the `2nd Calc` menu.