Teaching Chapter 10

This chapter is very different from those that have gone before. This chapter is about how the calculator screen is used to convey information. The ideas of the chapter are simple and straightforward, but they are important to the functioning of any calculator. These devices include no printer so their output must be communicated on this screen. And despite the fact that the screen is very small – 1 5/8 by 2 ½ inches – it can display a remarkable amount of information: 8 program lines, 7 lines of calculation, and quite sophisticated graphs for rectangular and polar coordinate systems. This chapter is about how that information gets to that screen.

Here then are some of the things you will want to accomplish in Chapter 10:

1. Your students should understand that the calculator screen is a rectangular set of locations called pixels, each of which can be turned on (darkened) or off (lightened).

2. They should know that each of those almost six thousand pixels may be individually turned on or off by the program command, Pxl-On and that almost all calculators and computers have their pixels represented by (row,column). For example, if you wish to darken the pixel five rows down and seven rows across from the upper left corner of the screen, you would enter the command Pxl-On (5,7). They should also understand that this order is entirely different from our usual (x,y) notation for points in the plane.

3. Students should know how to change from rectangular graphic notation to pixel notation, even though the higher level command Pt-On will make this conversion for them. They should also understand that this is just one example of a programming hierarchy in which lower level, very specific commands are organized and subsumed in easier-to-understand-and-use "higher level" commands. This chapter gives many examples of this central insight: for example, drawing axes, adding scales, changing screen dimensions and drawing graphs.

4. Although there are several programs in this chapter, PLOTXY, AXES, AXSCALE, LINE and QUAD, programming such elementary actions only represent examples and are not meant to be learned.