Stairs -- Part I

You will need the program STAIR. Set the window as follows:

```
WINDOW FORMAT
 Xmin=-9.4
 Xmax=9.4
 Xscl=1
 Ymin=-6.2
 Ymax=6.2
 Yscl=1
```

Execute the STAIR program. It will ask you for the x and y coordinate of a starting point, and the rise and run of the staircase. For example, if you enter:

> X=? 0
> Y=? 0
> RISE? 1
> RUN? 2

the program will draw a staircase by starting at the origin, and going up 1 and over 2, repeatedly until it gets off the screen. Then it draws a straight line back to its starting point.

To erase stairs, use (2nd) DRAW, 1: ClrDraw.

1. Try making various types of stairs. Write down some notes about how you achieve these results.
   a. Some should go up, some down.
   b. Some should be steep, some not.
   c. Some should sit on top of their line, some should hang below it.

2. What happens when you use 0 for the rise or run?

3. Record the inputs you use to solve these problems.
   a. Draw a staircase that starts in the lower left corner and goes to the upper right corner.
   ... Now start at the top right, and go back to the bottom left, getting the same line.
   b. Similarly, draw a staircase that starts in the upper left corner and goes to the lower right corner.
   ... Now start at the bottom right and go to the upper left, getting the same line.
   c. Explain how you did this.

4. Use ClrDraw, then draw two staircases with the same line, but different-sized steps. Explain how you did it.

5. Use ClrDraw, then draw two staircases with parallel lines. Explain how you did it.

6. **Challenge:** Draw two staircases with perpendicular lines.

Stairs -- Part II

1. For each problem, use STAT / EDIT and (2nd) STAT PLOT to show both points as fat dots, then draw a staircase whose line goes through both points. (It's OK to start on one of the points.) More than one staircase would be even better. You may use graph paper to plan your moves. Be sure to use ClrDraw between problems.
   a. (0,0) (3,6)
   b. (4,5) (-1,-5)
   c. (-1,0) (8,3)
   d. (1,-5) (5,3)
   e. (-5,-1) (9,6)

2. For each problem, graph the equation, then get a stair so whose line matches the given line exactly. Write down how you did it.
   a. $y = .5x$
   b. $y = 2x - 1$
   c. $y = -3x + 2$

3. For each problem, make the stairs, then find the equation of the line. Check by graphing it.
   a. X=0, Y=3, RISE=2, RUN=-3
   b. X=2, Y=3, RISE=-5, RUN=2

4. Make interesting staircase designs.