The EULER Program (TI-89)

To use this program:

- Entering the question: Make sure that your differential equation is in the form dy/dx = f(x,y).
  - Type the equation f(x,y) in “y1=” (keep your x as x and your y as y).
  - Go to your home screen and run the program.
  - (x0, y0) is your initial condition. When it asks “x0, y0=”?, type your initial x value and hit enter, then type your initial y value and hit enter.
  - h is the step size.
  - n is the number of steps you want the program to calculate at a time.

- Extra Functionality:
  - “continue?” this is asking whether you want the next y value using the same initial conditions and step size you already entered. (1 = yes, 0 = no)
  - “new h and n?” this is asking whether you want to change your step size.
    Note: this change will take place at your current x value. It does not restart the entire problem. (1 = yes, 0 = no)

- Example: dy/dx = x+y, y(0) = 1. You want h = 0.1 and the x-values from 0 to 1.
  - Type y1=x+y”, x0=0, y0=1, h=0.1, and n=1, then the program would give back y(0.1). Enter “1” when it asks if you want to continue. Then the program gives you back y(0.2). If you wanted y(1) without all the intermediate steps at the beginning instead of typing n=1, type n=10, and the program will display y(1).

To enter this program, get out of your Home screen and go to your menu. Go to program editor and choose option 3 : New. Name your program. You can find all the program functions in the menus at the top of the screen so you don’t have to type all the words.

Note: after you run your program, you will need to clear your variables. In your Home directory go to F6 and choose option 1 : clear a-z.