Functions and Looping with Integration

— Program Analysis —

- I need to know the left hand reiman sum for calculating integrals.
- I need to know the trapezoidal method for calculating integrals.
- I need to know how to calculate the area of a trapezoid.

— Program Design —

- Functions
  - Pick the math function (f(x) stuff) with input or sys.argv
    - We just need to know which function is which, returns a number corresponding to the function number
  - Pick the calc function (rectangular vs trapezoid) with input or sys.argv
    - We need to know which is rectangular and which is trapezoidal and returns a number that corresponds to which one we want (or both)
  - Pick how many regions we need to use to calculate each of the types of the sums with sys.argv and input
    - Arbitrarily picked by the user. The greater this number is, the more accurate the estimation. Returns an int.
  - Pick which point we want to use as a starting point with sys.argv or input
    - Where do we want to start on the curve, returns an int
  - Pick the ending point we want with sys.argv or input
    - Where do we want to end on the curve, returns an int
  - Do the actual math calculation based on function number and x value at that point

    - Send it an int, return an int.
- Ask if we want to keep going
    - Return a boolean
- Do the rectangular calculation with the previously picked information
    - Send it the regions, points, and function and get an int back
- Do the trapezoidal calculation with the previously picked information
    - Send it the regions, points, and function and get an int back

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— Test Cases —

INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT
Fun: 3, Calc: 0; Regions: 1, Start: 0, End: 1	0	0
Fun: 3, Calc: 0; Regions: 3, Start: 0, End: 1	.11111	.1111111111111
Fun: 2, Calc: 2; Regions: 99999, Start: 0, End: 1	24.9999999... and 25	24.999 and 25.0
Fun: 1, Calc: 2; Regions: 9999, Start: 0, End: 10	233.283333.... and 233.33333...	233.28332 and 233.333333
Fun: 4, Calc: 2; Regions: 9999, Start: -2, End: 10	7174.77 and 7176.00	7174.775935199282 and 7176.00005761154