MATH 1351 TI-85 EXERCISE XII
The TI-85 and Riemann Sums

Name: ___________________________  SID: _____________________________

Let’s estimate the areas under the graphs of some positive functions, above the x-axis, and between some x-values, say $a$ and $b$. We’ll do it by drawing rectangles called right boxes, whose right edge, hence height, is determined by the graph, and bases are the same lengths, $\Delta x$.

1. Use two such boxes (computing by hand) to approximate the area under the graph of $y = 1/x$, from $x = 1$ to $x = 3$. In fraction form the approximate is _________

2. Repeat the exercise using 3 boxes. In fraction form the approximate is _________

3. Repeat the exercise using 4 boxes. In fraction form the approximate is _________

Find the TI-85 command $\text{seq}$ by choosing 2nd MATH from the keyboard, then MISC from the screen menu. Enter the following command sequence onto the screen:

$$\text{seq}( (2/2)(1/(1+I(2/2))), I, 1, 2, 1 )$$

Press ENTER and then convert the answer to fraction form. You should see the terms summed in problem 1. From the same place your found $\text{seq}$ find $\text{sum}$. Choosing $\text{sum}$ 2nd ANS should sum the sequence found above and yield the same result as in number 1. Does it? _________

Now use the TI to repeat numbers 2 and 3 above. The general syntax is

$$\text{seq}( \Delta x f(a + I \Delta x), I, 1, N, 1)$$

where $N$ is the number of boxes and $\Delta x = (b - a) / N$.

4. Estimate the above area using 10 boxes. In fraction form the approximate is _________

5. Estimate the above area using 100 boxes. In fraction form the approximate is _________

   Use 100 boxes to estimate each of the following areas:

6. The area under one positive loop of the graph of the sine curve. The approximation is _________

7. The area under $y = x^5$ from $x = 0$ to $x = 2$. The approximation is _________

8. The area of the finite region determined by the x-axis and the graph of $y = x^4 - 2x^2 + 1$. The approximation is _________

9. The area under $y = e^{x^2}$ from $x = -1$ to $x = 1$. The approximation is _________

   What would be the syntax if we were using left boxes instead of right boxes to approximate the area?