

# 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 **seq** by choosing **2nd MATH** from the keyboard, then **MISC** from the screen menu. Enter the following command sequence onto the screen

**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 you found **seq** find **sum**. Choosing **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

**seq( *delta-x* f( a + I *delta-x* ), I, 1, N, 1 )** followed by **sum**

where **N** is the number of boxes and  $\text{delta-x} = (b - a) / N$ .

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?