Math 266B Section 02 (Barsamian) Computer Project 1: Pictures of Riemann sums

In exercises 6.1#1, 3, 33, 36, and 37 from Homework 1, you are asked to compute Riemann sums. In this first computer project, you will produce pictures that will illustrate your written solution to those exercises. (These pictures are meant to supplement a written solution; they are not a substitute.) The computer program that we will use is web-based, and is found on a page that is part of an interesting website called "mathworld".

1) Go to the web address `http://mathworld.wolfram.com/`
2) In the search box at the top of the page, type `Riemann sum`enter This will bring up a page of search results.
3) Click on the entry called *Riemann Sum -- From MathWorld*. This will bring up a page called *Riemann Sum*.

4) For each of the six exercises 6.1#1, 3, 33, 36, and 37, do the following steps to create a picture:
   a) Type the function into the box next to the words *"Graph the Riemann sum of"*. You will need to type the functions as `x^2`, `1-x^2`, `Exp[-x]`, and `Sin[x]`.
   b) Specify the lower and upper endpoints by typing appropriate numbers into the boxes. For exercise 6.1#37, you will need to type the upper endpoint as `3*Pi/2`.
   c) Specify the number of rectangles by typing the appropriate number into the box.
   d) Click on the little triangle by the box nest to the words *"by taking samples at the"*. This will open a small menu of choices, including *"maximum"*, *"minimum"*, *"left"*, *"right"*, or *"midpoint"*. Choose the type of sum that is called for in the particular exercise for which you are making a picture.
   e) Put a checkmark in the box by the words *"Print estimated and actual areas?"*
   f) Click on the `Replot` box. A picture of the specified Riemann sum should appear.
   g) Save the picture. If you know how to do this, fine. If not, try the following steps.
      - On a PC computer:
        With your mouse, right-click on the picture. This should cause a menu to pop up. One of the entries on this small menu will be *"save picture as..."*. Click on this entry bring up a dialog box that will let you give a file name and specify a location for the file.
      - On an Apple computer:
        With your mouse, control-click on the picture. This should cause a menu to pop up. One of the entries on this small menu will be *"save picture to disk"*. Click on this entry bring up a dialog box that will let you give a file name and specify a location for the file.
      - My suggestion is that you give the file a name like *picture for exercise 6.1#3*, or something similar. The most convenient location for the file is probably just the computer desktop.

Remark: If you make a lot of Riemann sum pictures, the program will stop and ask you to register by "clicking on the link below". The link is fairly inconspicuous: it shows up in the green box where you had been specifying your Riemann sums. Go ahead and register. This site will be useful to you throughout the course.

Once you have all five of the pictures saved, the next step is to create a document using a word processing program and import all the pictures into it.

5) Open a blank document in your word processing program.
6) Create a title like

   Pictures of Riemann sums for exercises 6.1#1, 3, 33, 36, and 37
   Mark Barsamian, Math 266B Computer Project #1, Due Friday March 31, 2006

   Note: to get credit for the computer project, your document needs to have a title that contains your name.
7) Insert each of the five pictures into the document. Type a caption for each, indictating the exercise number.
8) Print the document and attach it to your Homework 1 solutions. Remember that your solutions should include written solutions to exercises 6.1#3 and 6.1#36. The pictures that you are turning in are meant to be a supplement to your written solutions.