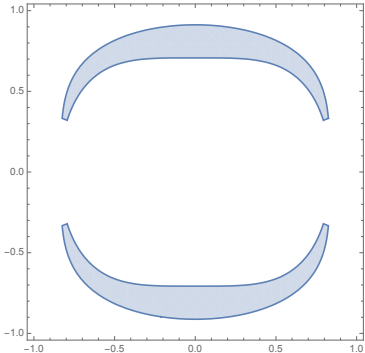# Laboratory 8: Random Module — Processing Files

Select Three of the Following Five Exercises

1. Calculate approximately the area of the two dimensional region defined by the two simultaneous conditions $e^{x^2+y^4} < 2$ and $x^4 + y^2 > 0.5$. The region is depicted on the right.   You can see that it fits neatly in the square $[-1,1] \times [-1,1]$.

2. Print out all lines in "Alice in Wonderland" that
   a. contain both the letter y and the letter z.
   b. contain a word with "ing" in it.
   c. contain a word with more than 15 letters, but without counting punctuation marks and without hyphens.

3. Open up the Iris data file and
   a. calculate the average sepal length, sepal width, petal length, and petal width of all the flowers in the dataset for each of the three species.
   b. find the maximum petal length for each of the three species. (Hint: To find a maximum, you need to store the previous best-seen value.)

4. Use the countries.txt file (from the Kaggle datasets) in order to find the two countries with the highest population density using a Python program. The easiest way to do this is to scan the file and maintain the two highest population densities seen so far as well as the country names.

5. Write a program that converts the numbers.txt file to one where the comma-separation is replaced by a blank space separation. The numbers are supposed to be neatly aligned, with decimal points on top of decimal points.