MATH 1310 Programming Project #7

You have the whole class period to work on the project with your group. You are required to use your own calculator and turn in your own paper. Be sure to answer all of the questions asked.

The following is a family of resonance curves:

$$y = \frac{1}{(1-x)^2 + 2ax} \qquad (a > 0,\ x \geq 0)$$

1. Write a program to graph the resonance curves for $a = 0.05$, 0.1, 0.15, 0.2, and 0.25 all on the same graph. Write down your program and sketch the output graph in an appropriate window.

2. Find the critical points of the resonance curve algebraically.

3. Show that for values of a very near to zero, there is a critical point at approximately $\langle 1, \frac{1}{2a} \rangle$. What happens when $a = 0$?

4. Explain why this family of curves is not interesting for $a > 1$.

5. What is the geometric significance of the parameter a?