Subject: Mathematics - Algebra II   Grade: Eleventh

Standard: #3 Systems of Equations and Inequalities
              #6 Quadratic Equations

Key Concept: Students solve systems of equations, quadratic equations, and
               inequalities.

Generalization: Students use graphs to find intersection points of systems of
                equations, quadratic equations, and inequalities.

Background:
      Students have already studied equations, quadratic equations, inequalities, and
      have most recently been working with systems of equations and inequalities.
      Students have also used graphing calculators to find intersection points on
      graphs of systems of equations and/or inequalities.

      This is a fairly advanced assignment and requires students to go beyond what
      might be typically covered in Algebra II course. It may be necessary for the
      teacher to illustrate a simple example for each tier. Students should work in
      small groups of two or three to complete the assignment.

This lesson is tiered in *process* according to *learning style*.

Tier I: *Logical-Mathematical Learners*
      Students in this tier are given a picture of a logo, e.g. the Volkswagen emblem,
      a logo from a local business, or a logo which the teacher has designed. In
      addition, students are given several systems of equations and/or inequalities
      which might represent the logo. Students must decided which system best fits
      the logo and determine all the intersection points of the graph. Additional
      questions could be asked about specifying the system for particular regions of
      the graph. An example of a similar problem can be found in Algebra 2 An
      Integrated Approach, ISBN #0-669-43285-7, page 275.

Tier II: *Visual/Spatial Learners*

Students in this tier design their own logo first. Ideas for logos include a fancy way to write your initials, the school's emblem, or a copy of a familiar company logo. You might want to have specific instructions about the number of equations and inequalities which must be used to describe the design. Students determine the linear equations/inequalities and/or quadratic equations/inequalities needed to make a graph of the logo. The last step is for the students to determine the intersection points of the equations and inequalities. Additional questions could be asked about specifying the system for particular regions of the logo which might be shaded or colored.

Assessment:
Grade the assignment for accuracy of the answers.