A webpage which can help you with this assignment will be linked to the course website. You are encouraged to discuss this assignment with other students and with the instructors, but the work you hand in should be your own.

A webpage listing individual data for each student will also be posted on the course website. For this lab the data will be two functions and three constants.

- The first function, $F(x, y)$, will be a second degree polynomial of two variables (x and y). There will also be a specific value given for x, let's say $x = a$.
- The second function, $G(x, y, z)$, will be a second degree polynomial of two variables (x, y, and z). There will also be a value given for x and a value given for y, let's say $x = b$ and $y = c$.

Use `Maple` to help you answer the following questions.

What kind of curve is $F(x, y) = 0$? Is it a hyperbola, a parabola, or an ellipse? For which values of y is (a, y) on the curve $F(x, y) = 0$? (Usually there will be two values of y, but you may be lucky, and there may be only one.) For each of these values of y, use `Maple` to compute a vector normal to $F(x, y) = 0$. Then use `Maple` to draw this vector or vectors, together with the curve $F(x, y) = 0$.

What kind of surface is $G(x, y, z) = 0$? Is it a cylinder (what type of cylinder?), a cone, a paraboloid (what type of paraboloid?), an ellipsoid, or a hyperboloid (what type of hyperboloid?). For which values of z is (b, c, z) on the curve $G(x, y, z) = 0$? (Usually there will be two values of z, but you may be lucky, and there may be only one.) For each of these values of z, use `Maple` to compute a vector normal to $G(x, y, z) = 0$. Then use `Maple` to draw this vector or vectors, together with the surface $G(x, y, z) = 0$.

This assignment is due 10/08/13.

Please hand in the following material:

0. All pages should be labeled with your name and section number. Also, please *staple* together all the pages you hand in.
1. A printout of all `Maple` commands you have used.
2. A clear picture of $F(x, y) = 0$ including your identification of the curve. The identification can be done "by hand" on your printout. Show evidence for your assertion.
3. Indicate clearly the coordinates of the point or points (a, y) in your computations.
4. A picture of the curve $F(x, y) = 0$ together with the normal vectors. Select the picture carefully. It should show the vectors as perpendicular to the curve.
5. A clear picture of $G(x, y, z) = 0$ including your identification of the surface. You may give several pictures and select your views carefully. The identification can be done "by hand" on your printout. Show evidence for your assertion.
6. Indicate clearly the coordinates of the point or points (b, c, z) in your computations.
7. A picture of the curve $G(x, y, z) = 0$ together the normal vectors. Select the picture carefully. It should show the vectors as perpendicular to the surface. You may need to give several views of this picture and select your views carefully.