Mathematics 1350H – Linear algebra I: Matrix algebra
TRENT UNIVERSITY, Summer 2014

Assignment #4
Due on Tuesday, 10 June, 2014.

Linear algebra for non-linear equations?

Recall that the general equation of a circle of radius r centred at the point (p, q) is $(x-p)^2 + (y-q)^2 = r^2$, and that the general equation of a parabola with a vertical axis of symmetry is $y = ax^2 + bx + c$. Consider the points $(5, 1)$, $(-2, 0)$, and $(6, -6)$.

1. Find the equation of the (only!) circle which pass through the three given points. *[5]*

2. Find the equation(s) of (all) the parabola(s), if any, with a vertical axis of symmetry which pass through the three given points. *[5]*

NOTE: In general, three points in a plane that are not all in a straight line determine a unique circle that passes through all three. This can be shown, among other ways, by a souped-up version of a correct method for doing **1**.