

M1GLA Geometry and Linear Algebra

Test 1

You need to show your working and justify your answers.

1. Find the perpendicular distance from the point $(3, 2)$ to the line with direction vector $(5, 4)$ that contains the point $(-1, -1)$.
2. Reduce the conic $x^2 - xy + y^2 = 4$ to standard form by rotation and translation, and hence determine its type.
3. Find the foci and the directrices of the ellipse $2x^2 + 7y^2 = 14$.
4. Solve the linear system by Gaussian elimination (i.e. by reducing the augmented matrix to echelon form)

$$\begin{array}{rcl} x_1 - x_3 & = & 1 \\ x_1 + x_2 - x_3 & = & -1 \\ x_1 + x_2 + x_3 & = & 1 \end{array}$$