(1) Using the equation 
\[ Ax + By + C = x^2 + y^2, \]
find a circle passing through the points (1, 7), (−1, 3), and (0, 0). After finding A, B, and C, put the circle’s equation in the standard form
\[ (x - c_x)^2 + (y - c_y)^2 = r^2. \]
(complete the squares.)
(2) Find the ellipse of minimal area which is of the form

$$(x, y) \mathbf{M} \begin{pmatrix} x \\ y \end{pmatrix} = 1$$

where $\mathbf{M} = \begin{pmatrix} A & C \\ C & B \end{pmatrix}$, and which passes through the points $(1, 1)$ and $(-1, 2)$.

The area of such an ellipse is $\frac{\pi}{\sqrt{\det(M)}}$. 