Homework Assignment for Polar Coordinates

(1) Find the polar equation of the ellipse $9x^2 + 4y^2 = 36$.

(2) Write $r = \frac{1}{1-\cos\theta}$ in cartesian form.

(3) Sketch the curve $r = 2a(1 + \cos\theta)$. Find the polar coordinates of the points in which the curve meets the line $2r\cos\theta + a = 0$.

(4) Find the area of the inner loop of the curve $r = 1 + 2\cos\theta$.