Q1. Let C be the parametric curve $x = \sin 2t$, $y = \sin t - \cos t$, $0 \le t \le \frac{3\pi}{4}$.

   a. Eliminate the parameter to find a Cartesian equation of the curve C and identify it.

Q2: Let C be the parametric curve $x = 3 - t^3$, $y = 2t^2$, $-\infty < t < \infty$. Find the points, if they exist, on the curve C at which there exists a vertical tangent line or a horizontal tangent line.

Q3: Let R be the region outside the circle r = 3 and inside the cardioid r=3 -3 cos θ. Sketch R and find its area.