Homework 5

1. Sketch the curve represented by the parametric equations (indicate the orientation of the curve), and write the corresponding rectangular equation by eliminating the parameter.

(a) $x = 2 + 4\cos t,\ y = 3 + 4\sin t,\ \text{for } 0 \le t \le 2\pi$

(b) $x = 6 - t^2, y = \frac{t}{2},\ \text{for } -2 \le t \le 4$

2. Find the slope of the tangent line to the Scrambler path described by $x = 2\cos t + \sin 2t,\ y = 2\sin t + 2\cos 2t$ at (a) $t = 0$ and (b) the point(0 , -3)
3. Find the surface area of the surface formed by revolving the half-ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1,\ y \ge 0,$ about the x-axis.