MATH 201 QUIZ 1

1. Eliminating the parameter, find the Cartesian equation of the following curve and sketch it with an arrow the direction in which the curve is traced as the parameter increases.

$$x = \frac{1}{3}\cos\theta, \quad y = \sin\theta + 1, \quad 0 \le \theta \le \pi/2.$$

2. Find the area of surface obtained by rotating the following curve around the x-axis.

$$x = t^2 - 2t, \quad y = \frac{8}{3}t\sqrt{t}, \quad 0 \le t \le 1.$$

3. For the curve given by the polar equation $r = 1 + 2\cos\theta.$,
   (a) Sketch the curve.
   (b) Find the equation of the tangent line at $\theta = \pi/2$.