(P655#7) 1. Find an equation of the tangent line at $P(1,3)$ to the curve $x = 1 + \ln t$, $y = t^2 + 2$ by two methods: **(a)** without eliminating the parameter and **(b)** by first eliminating the parameter.

(P655#11) 2. For the parametic curve $x = t^2 + 1$, $y = t^2 + t$, find dy/dx and d^2y/dx^2. For which values of t is the curve concave upward?

(P655#25)   3. Show that the curve $x = \cos t, \ y = \sin t \cos t$ has two tangents at $(0,0)$ and find their equations. Sketch the curve.

(P656#43)   4. Write an itegral for the length of the curve defined by: $x = t \sin t, \ y = t \cos t, \ 0 \le t \le 1$. [Do not compute the integral.]

(P656#51)   5. Find the distance traveled by a particle with position (x, y) as t varies in the given time interval. Compare with the length of the curve. $x = \sin^2 t, \ y = \cos^2 t, \ 0 \le t \le 3\pi$.