Calculus BC

Section 10.3 - Parametric Equations and Calculus

Derivative of parametric functions:

$$\frac{dy}{dx} = \frac{dy/dt}{dx/dt}$$

$$\frac{d^2y}{dx^2} = \frac{d}{dx}\left[\frac{dy}{dx}\right] = \frac{\frac{d}{dt}\left[\frac{dy}{dx}\right]}{dx/dt} \quad \text{or} \quad \frac{dy'}{dx/dt}$$

Arc Length of parametric functions:

$$L = \int_a^b \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2}$$