

10.1 - Parametric Equations

Calculus II

1. For the given parametric equations, find the points (x,y) corresponding to the parameter values $t = -2, -1, 0, 1, 2$.

$$x = 9t^2 + 9t, y = 3^{t+1}$$

$$t = -2 \rightarrow (x, y) =$$

$$t = -1 \rightarrow (x, y) =$$

$$t = 0 \rightarrow (x, y) =$$

$$t = 1 \rightarrow (x, y) =$$

$$t = 2 \rightarrow (x, y) =$$

2. Eliminate the parameter for the given parametric equations and sketch the graph.

a. $x = 4 - 2t, y = 3 + 6t - 4t^2$

b. $x = \sqrt{t+1}, y = \frac{1}{t+1}, t > -1$

c. $x = e^{-9t}, y = e^{9t}$

10.2 - Parametric Curves

1. Find $\frac{dx}{dt}$, $\frac{dy}{dt}$, and $\frac{dy}{dx}$

a. $x = 6t^3 + 4t, y = 3t - 5t^2$

b. $x = 2te^t, y = 8t + \sin(t)$

2. Find an equation of the tangent to the curve at the point corresponding to the given value of the parameter.

$x = t^5 + 1, y = t^6 + t; t = -1$

3. Find the surface area generated by rotating the given curve about the y-axis.

$x = 6t^2, y = 4t^3, 0 \leq t \leq 1$