Calculus Section 10.3 Parametric Equations and Calculus

Homework: page 711 #’s 5 – 11 odd, 15, 29, 32, 45 – 47

-Find the slope of a tangent in given by parametric equations

-Find the arc length of a curve given by a set of parametric equation

If a smooth curve *C* is given by the equations x = f(t) and y = g(t), then the slope of *C* at the point (x , y) is

given by: . The second derivative is:

**Example)**  
Given the parametric equations, find  .

**Example)**

Given the parametric equations, write an equation of the tangent line to the curve at the point where 

**Example)**Find the equation of line tangent to the curve given by x = 2 – 3cosθ and y = 3 + 2sinθ at the point (-1, 3).

**Example)**

Find all points of horizontal and vertical tangency given the parametric equations 

**Arc Length in Parametric Form**If a smooth curve C is given by x = f(t) and y = g(t) such that C does not intersect itself on the interval (a, b),

then the arc length of C over the interval is given by:

**Example)**

A particle moves along the smooth curve given by x = t2 + 1 and y = 4t3 – 1. How far did the particle travel between t = 0 and t = 5?