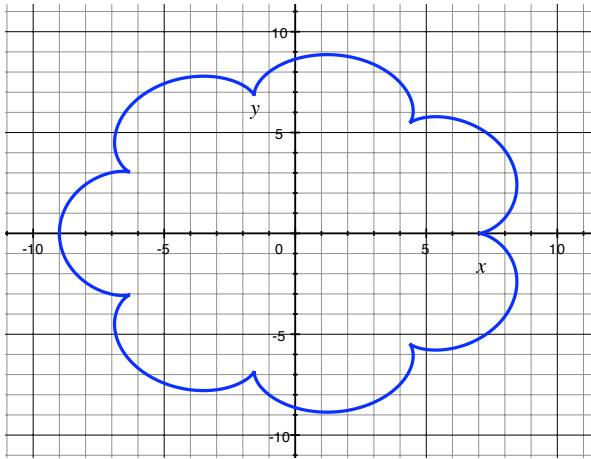


Math 124 Worksheet #6

May 25, 2007

1. The equations $x(t) = 8\cos(t) - \cos(8t)$ ($0 \leq t \leq 2\pi$) trace out an epicycloid.
 $y(t) = 8\sin(t) - \sin(8t)$



- (a) Indicate the approximate location on the graph of the point at which $t = \frac{\pi}{2}$.
- (b) Find the equation of the tangent line when $t = \frac{\pi}{2}$.

2. Find the extreme values of the following functions on each indicated interval.

(a) $f(x) = x^3 - 3x + 1$ on $[-3, 2]$

(b) $g(x) = \frac{3x^2}{x-3}$ on $[4, 8]$

(c) $h(x) = x^2e^{-4x}$ on $[-.1, 4]$

3. $f(x) = 1 - 3xe^{\frac{1}{4}x}$

- (a) Find the linearization of f at $x = 0$.

- (b) Use the linearization to approximate the x -value for which $f(x) = 2$. (Trying to algebraically solve for x such that $f(x) = 2$ is difficult, so this is a good time for approximation.)