Mth 253 Parametric Practice Name

1) Find the parametric equation for a line passing through (a,b) and (c,d).

2) Find the parametric equation for a line passing through (-3, 5) at $t=0$ and (5, 9) at $t=10$.

3) Find a parametric equation for a line segment from (-3, 5) to (5, 9) with (a) $t \in [0, 1]$, (b) $t \in [0, T]$, (c) $t \in [0, \infty]$,

4) Find the parametric equation for a line segment oscillating between (-1, -1) & (1, 1).

5) Find the parametric equation for a ray from the origin passing through (a,b) and accelerating.

6) Find dy/dx for $x = t^2 - 1$, $y = 2t + 1$ at $t = 1$ in 3 ways: 1st: Use $\left.\frac{dy/dt}{dx/dt}\right|_{t=1}$. 2nd: Convert to a function $y = f(x)$ and find $y'(x1)$. You must determine $x1 = x(1)$. 3rd: Eliminate t and create an implicit equation. Use implicit differentiation to find dy/dx.

7) Find the arc length of $x = (1 + t)^2$, $y = (1 + t)^3$ $t \in [0,1]$. Sketch the segment.

8) Show that $x = t^3 - 4t$, $y = t^2$ intersects itself at (0, 4). Then find the angle of that intersection. Algebraically find all intercepts and horizontal/vertical critical points and their t-values.

9) Convert $x^2 + y^2 = r^2$ to a parametric form where $(x, y) = \frac{(r, r)}{\sqrt{2}}$ at $t = 1$ and again at $t = 10$.

10) Consider $x = f(t)$, $y = g(t)$. How does that compare to $x = f(h(t))$, $y = g(h(t))$?