DATE: _____

Chain Rule Practice (including Polar, Vectors, and Parametric)

1. Find $\frac{dy}{dx}$ given $y = \tan(\cos x)$

2. If $y = 2\cos\frac{x}{2}$, then find $\frac{d^2y}{dx^2}$.

3. Let the velocity vector be defined as $v(t) = \langle \sin^2 \pi t\,, \cos \pi t \rangle$, where t is measured in seconds and $v(t)$ is measure in feet. Find the acceleration vector at $t = 2$.

4. Find the slope of the line tangent to $f(x) = x(1-2x)^3$ at $(1, -1)$.

5. Given a curve defined by the parametric equation $x(t) = (2t^3 - 1)^4$ and $y(t) = \sqrt{\sin t}$. Find the slope of the line tangent to the curve.

6. Find the equation of the tangent line to the graph of $r = 3 - 2\sin\theta$ at $\theta = \pi$.