Problem statement It is certainly possible for the set of critical points of a function defined in $\mathbf{R}^3$ to be a point (e.g., $x^2+y^2+z^2$) or a line (e.g., x^2+y^2) or a plane (e.g., x^2). Can you create a function $F : \mathbf{R}^3 \to \mathbf{R}$ whose set of critical points is all of the twisted cubic, $\mathbf{c}(t) = (t, t^2, t^3)$?