Assigned: 3-25-16

Suppose that $F(x, y, z) = \langle M(x, y, z), N(x, y, z), P(x, y, z) \rangle$ is a vector field on $\mathbb{R}^3$, and $C$ is a curve in $\mathbb{R}^3$ with parametrization $f : [a, b] \to C$. Let $\varphi$ be the 1-form on $C$ given by $\varphi = F \cdot \vec{T} ds$. Calculate the pull-back of $\varphi$ under $f$. 