Problems: Work Along a Space Curve

1. Find the work done by the force $\mathbf{F} = -y\mathbf{i} + x\mathbf{j} + z\mathbf{k}$ in moving a particle from $(0, 0, 0)$ to $(2, 4, 8)$
(a) along a line segment
(b) along the path $\mathbf{r} = t\mathbf{i} + t^2\mathbf{j} + t^3\mathbf{k}$.

2. Let $\mathbf{F} = \boldsymbol{\nabla}f$, where $f = \dfrac{1}{(x + y + z)^2 + 1}$. Find the work done by $\mathbf{F}$ in moving a particle from the origin to infinity along a ray.

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