Math 3113 - Multivariable Calculus

Quiz #8 - 2006.03.10

Name: _____

Consider an object traveling along the curve $\overrightarrow{r(t)} = \langle \cos(t) + t\sin(t), \sin(t) - t\cos(t), 1 \rangle$ for $t \geq 0$. Answer the following questions concerning $\overrightarrow{r(t)}$.

1. Compute the arc length function $s(t)$ for $\overrightarrow{r(t)}$ defined as above.

2. How long does it take the object to travel a distance of $2\pi^2$ units from its starting point at time $t = 0$?

3. Where is the object located in (x, y, z) coordinates after it has traveled a distance of 10 units?