

February 20, 2004

Show all work for credit.

1. Find the tangential and normal components of the acceleration vector.

$$\mathbf{r}(t) = \begin{bmatrix} \cos t \\ \sin t \\ t \end{bmatrix}$$

Remember that $a_T = \frac{\mathbf{r}'(t) \cdot \mathbf{r}''(t)}{\|\mathbf{r}'(t)\|}$ and $a_N = \frac{\|\mathbf{r}'(t) \times \mathbf{r}''(t)\|}{\|\mathbf{r}'(t)\|^2}$

2. Find and sketch the domain of $f(x, y) = \ln(9 - x^2 - 9y^2)$