

Quiz 7

Apr. 27, 2006

Given that

$$\mathbf{r}(t) = \langle \cos 3t, \sin 3t, t \rangle,$$

- (5 pts) find the unit tangent vector $\mathbf{T}(t) = \frac{\mathbf{r}'(t)}{\|\mathbf{r}'(t)\|}$ and the principal unit normal vector $\mathbf{N}(t) = \frac{\mathbf{T}'(t)}{\|\mathbf{T}'(t)\|}$

- (3 pts) find the binormal vector $\mathbf{B}(t) = \mathbf{T}(t) \times \mathbf{N}(t)$

- (2 pts) find the curvature $\kappa = \frac{\|\mathbf{T}'(t)\|}{\|\mathbf{r}'(t)\|}$

Write your solutions as complete as possible. Working time: 15 minutes.