

Math 275-002
Third Written Assignment
Due at class time
13 September

- (1) If $\mathbf{r}''(t) = -\mathbf{i} - \mathbf{j} - \mathbf{k}$ and $\mathbf{r}(0) = 10\mathbf{i} + 10\mathbf{j} + 10\mathbf{k}$ and $\mathbf{r}'(0) = \mathbf{0}$, find $\mathbf{r}(t)$.
(2) Find the unit tangent vector for the curve

$$\mathbf{r}(t) = \langle 2 \cos(t), 2 \sin(t), \sqrt{5}t \rangle$$

- (3) Find the curvature κ , the unit tangent vector \mathbf{T} and the unit normal vector \mathbf{N} for the curve

$$\mathbf{r}(t) = \langle e^t \cos(t), e^t \sin(t), 2 \rangle$$

- (4) Find the length of the portion of the curve

$$\mathbf{t}(t) = \langle 4 \cos(t), 4 \sin(t), 3t \rangle$$

for $0 \leq t \leq \pi/2$