

QUIZ 4

(25MINS, 20PTS)

Please write down your name, SID, and solutions discernably.

Name :

SID :

Score :

1. (10pts : 5pts each) Find the unit tangent vector $\mathbf{T}(t)$ at the point with the given value of the parameter t .

a) $\mathbf{r}(t) = \langle 4t, t^2 - t, t^3 - \frac{3}{2}t^2 \rangle, \quad t = 2.$

b) $\mathbf{r}(t) = \ln t \mathbf{i} + 2\pi \sin(\frac{\pi}{2}t) \mathbf{j} + (t^4 + 4t) \mathbf{k}, \quad t = 1.$

2. (10pts : 5pts each) Find the length of the curve.

a) $\mathbf{r}(t) = \sin 3t \mathbf{i} + 4t \mathbf{j} + \cos 3t \mathbf{k}, \quad 1 \leq t \leq 4.$

b) $\mathbf{r}(t) = \langle \frac{8}{3}t^{\frac{3}{2}}, 4t, \frac{1}{2}t^2 - 3t \rangle, \quad 0 \leq t \leq 3.$