Diferansiyel Geometri II Arasınav Cevap Anahtarı

SORU 1) $\alpha(s) = \left(\frac{4}{5}\cos s,\ 1-\sin s,\ -\frac{3}{5}\cos s\right)$

$$\alpha'(s) = \left(-\frac{4}{5}\sin s,\ -\cos s,\ \frac{3}{5}\sin s\right)$$

$$\|\alpha'(s)\| = \left(\frac{16}{25}\sin^2 s + \cos^2 s + \frac{9}{25}\sin^2 s\right)^{1/2} = 1 \quad \text{eğri birim hızlı}$$

$$T = \alpha'(s) = \left(-\frac{4}{5}\sin s,\ \cos s,\ \frac{3}{5}\sin s\right)$$

$$\alpha''(s) = \left(-\frac{4}{5}\cos s,\ -\sin s,\ \frac{3}{5}\cos s\right) \qquad \|\alpha''(s)\| = 1$$

$$N = \frac{\alpha''(s)}{\|\alpha''(s)\|} = \left(-\frac{4}{5}\cos s,\ -\sin s,\ \frac{3}{5}\cos s\right)$$

$$B = T \times N = \begin{vmatrix} e_1 & e_2 & e_3 \\ -\frac{4}{5}\sin s & \cos s & \frac{3}{5}\sin s \\ -\frac{4}{5}\cos s & -\sin s & \frac{3}{5}\cos s \end{vmatrix} = \left(\frac{3}{5},\ 0,\ \frac{4}{5}\right)$$

$$K = \|T'\| = \|\alpha''(s)\| = 1$$

$$\underbrace{B'(s)}_{0} = -\tau(s)\,N(s) \Rightarrow \quad \tau = 0.$$

Soru 2) Çözümü için defterinize bakınız

Soru 1) Çözümü için defterinize bakınız

Soru 4)

$W = \tau T + \kappa B$

$T' = W \times T$

$N' = W \times N$

$B' = W + B$

$$\begin{bmatrix} T' \\ N' \\ B' \end{bmatrix} = \begin{bmatrix} 0 & \kappa & 0 \\ -\kappa & 0 & \tau \\ 0 & -\tau & 0 \end{bmatrix} \begin{bmatrix} T \\ N \\ B \end{bmatrix}$$

$T' = \kappa N$

$N' = -\kappa T + \tau B$

$B' = -\tau N$

$\kappa = \langle T', N \rangle$

$\tau = \langle N', B \rangle$

$$W \times T = (\tau T + \kappa B) \times T = \tau \underbrace{(T \times T)}_{0} + \kappa \underbrace{(B \times T)}_{N}$$

$$\boxed{T' = \kappa N}$$

$$W \times N = (\tau T + \kappa B) \times N = \tau \underbrace{(T \times N)}_{B} + \kappa \underbrace{(B \times N)}_{-T}$$

$$\boxed{N' = \tau B - \kappa T}$$

$$W \times B = (\tau T + \kappa B) \times B = \tau \underbrace{(T \times B)}_{-N} + \kappa \underbrace{(B \times B)}_{0}$$

$$\boxed{B' = -\tau N}$$

bulunur.