

Problem 1

Find the length of the curve $r(t) = 2 \cos(3t) i + 2 \sin(3t) j + 2t k$, from $t = 0$ to $t = \pi$.

Problem 2

For $r(t) = e^{2t} i + \tan(t) j + t^3 k$, find the unit tangent vector T .

Problem 3

For $r(t) = 2 \cos(3t) i + 2 \sin(3t) j + 2t k$, find the curvature, κ .

Problem 4

For $r(t) = 2 \cos(3t) i + 2 \sin(3t) j + 2t k$, find the principal unit normal, N .