Lecture VI Notes

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1 Arc Length and Curvature of Three Dimensional Functions – 13.3

As the arc length of a two dimensional function is defined by: $\int_a^b \sqrt{f'(t)^2 + g'(t)^2}dt$, the arc length of a three dimensional function is defined by: $\int_a^b \sqrt{f'(t)^2 + g'(t)^2 + h'(t)^2}dt$, or more simply: $\int_a^b |\vec{r}'(t)|dt$

The curvature, κ, of a vector function may be found using the formula: $\kappa(t) = \frac{|\vec{r}'(t) \text{ x } \vec{r}''(t)|}{|\vec{r}'(t)|^3}$