Steps for Analyzing Line Integrals

You wish to evaluate an integral of the form:

$$\int_C \mathbf{A}(\bar{r}_c)\cdot\overline{d\ell}$$

To successfully accomplish this, simply follow **these** steps:

Step 1: Determine the 2 equalities, 1 inequality, and $\overline{d\ell}$ for the **contour** *C*.

Step 2: Evaluate the **dot product** $\mathbf{A}(\bar{r})\cdot\overline{d\ell}$.

Step 3: Transform all coordinates of the resulting **scalar** field to the **same** system as *C*.

Step 4: Evaluate the scalar field using the **two** coordinate **equalities** that describe contour *C*.

Step 5: Determine the **limits of integration** from the **inequality** that describes contour *C (be careful of order!)*.

Step 6: Integrate the remaining function of **one** coordinate variable.