

1. Evaluate $\oint \vec{F} \cdot d\vec{r}$ explicitly as a line integral, where $\vec{F} = r^3 \hat{\phi}$ and C is the circle of radius 3 in the xy -plane, oriented in the usual, counterclockwise direction (as seen from above).

2. **Stokes' Theorem**

- List at least 3 different surfaces which you could use with Stokes' Theorem to evaluate the line integral in the previous problem.
- Evaluate the surface integral for any one of the surfaces on your list.
- If time permits, evaluate the surface integral for other surfaces on your list.