Special Problem 2-5.6
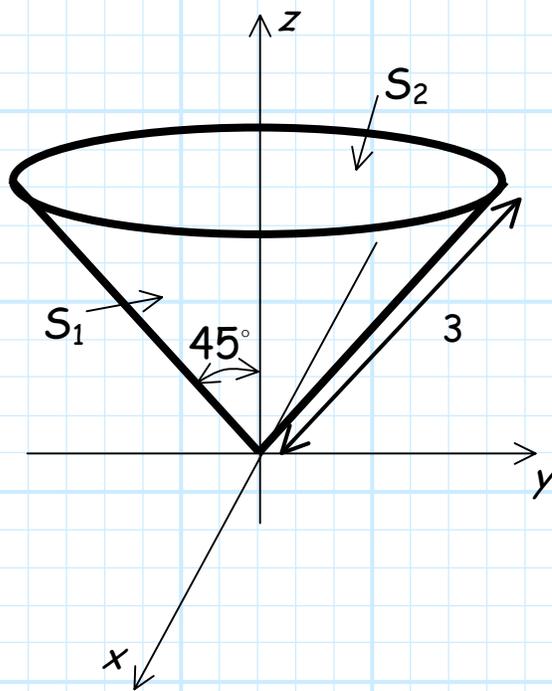
Evaluate the **surface** integral:

$$\iint_S \mathbf{A}(\bar{r}) \cdot \overline{ds}$$

where:

$$\mathbf{A}(\bar{r}) = \left(\rho^2 + z^2\right)\hat{a}_\rho + \rho\,\hat{a}_\phi$$

and S = S₁ + S₂ where:

In other words, S₁ is a 45 degree **cone**, and S₂ is the **flat** surface that forms the top of the cone.