

Special Problem 2-5.15

Determine the surface integral:

$$\iint_S \mathbf{A}(\bar{r}) \cdot d\bar{s}$$

where:

$$\mathbf{A}(\bar{r}) = 3 \sin \phi \hat{a}_\rho + \frac{\cos \theta \sin \phi}{r} \hat{a}_\phi + 4r \sin \phi \hat{a}_z$$

Note surface S lies entirely on the $z-y$ ($x=0$) plane, but entirely above the $x-y$ ($z=0$) plane:

Hint: Keep the direction of $d\bar{s}$ consistent!

