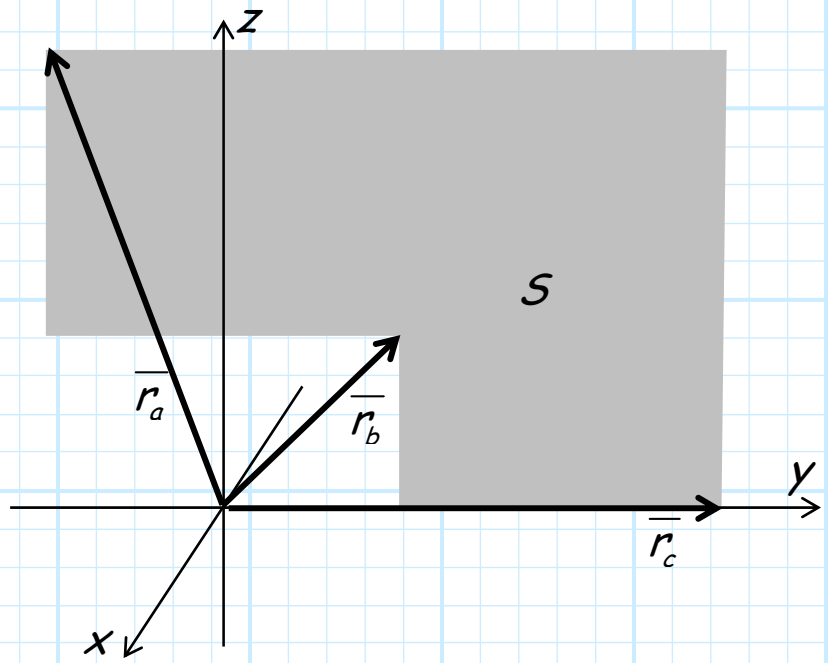
Special Problem 2-5.28

The surface *S* below lies completely on the **y-z plane**.

The horizontal edges of the surface are **parallel** to the **y-axis**, while the vertical edges of the the surface are **parallel** to the **z-axis**.

Three position vectors point to three of the **corner** points of this surface. These position vectors are:

$$\bar{r}_a = -\hat{\mathbf{a}}_y + 3\,\hat{\mathbf{a}}_z \qquad \bar{r}_b = \hat{\mathbf{a}}_y + \hat{\mathbf{a}}_z \qquad \bar{r}_c = 3\,\hat{\mathbf{a}}_y$$



There exists throughout space a vector field:

$$\mathbf{A}(\bar{r}) = \rho \sin\phi\,\hat{\mathbf{a}}_x + \rho^2\,\hat{\mathbf{a}}_y + \rho z\,\hat{\mathbf{a}}_z$$

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