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A fishing net S is in the shape of a triangular trough, as shown in the picture. The triangular sides are at $x = 0$ and $x = 5$, the rectangular sides are at $45°$ to the vertical, and the bottom is at $z = 0$; all lengths are measured in cm. There is no netting across the top, which is at $z = 1$. Water is draining out of the net; the motion of the water is described by the vector field $\vec{\boldsymbol{F}} = \rho\left(ae^{\kappa z^2}\hat{\boldsymbol{y}} - b\,\hat{\boldsymbol{z}}\right)$ where $a = 3\,\frac{\text{cm}}{\text{s}}$, $b = 5\,\frac{\text{cm}}{\text{s}}$, $\kappa = 2\,\text{cm}^{-2}$, and ρ is the (constant) density of the water in $\frac{\text{g}}{\text{cm}^3}$. The goal of this problem is to find the best way to evaluate the flux

$$\iint \vec{\boldsymbol{F}} \cdot d\vec{\boldsymbol{S}}$$

of water *down* through S.

- Set up the above surface integral, **but do not evaluate it**
  Your answer should be ready to integrate; among other things, all substitutions should be made, and you should determine the correct limits.

- **Use the Divergence Theorem** to find another way to do the problem.
  This time, complete the computation.