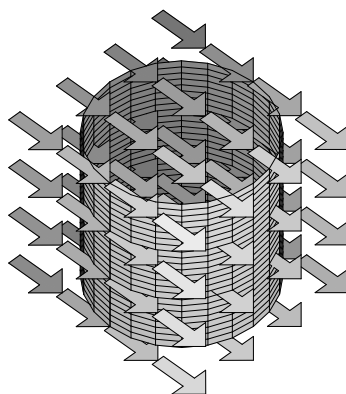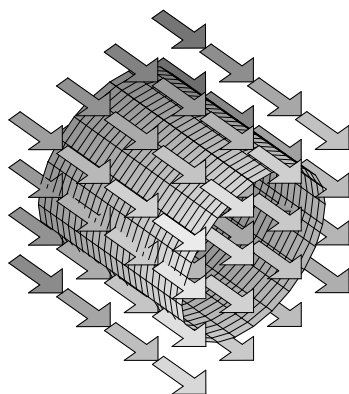1. Flux

(a) What do you think will be the flux through the cylindrical surface that is placed as shown in the constant vector field in the figure on the left?

(b) What if the cylinder is placed upright, as shown in the figure on the right? Explain.

2. Find the flux of $\vec{F} = z^2\,\hat{k}$ through the upper hemisphere of the sphere $x^2 + y^2 + z^2 = 25$, oriented away from the origin.