1. Set up an integral to compute the flux of $\underline{F} = 2y\underline{i} + 2x\underline{j} + -xy\underline{k}$ through S where S is oriented upward and is the part of the surface $z = 3xy$ above the square surface in the xy-plane with $2 \leq x \leq 5$, $1 \leq y \leq 6$.

   Do not integrate.

2. Find the flux of $\underline{F} = (\cos(yz) + x)\underline{i} + (e^{x^2+z^2} - y)\underline{j} + (\tan 2xy)\underline{k}$ out of the solid box $0 \leq x \leq 2, 0 \leq y \leq 3, 0 \leq z \leq 4$.

3. Consider a solid region W between a paraboloid that opens upwards from the origin, S_1, and the plane $z = 5$. Let S_2 be the piece of the plane that forms the upper boundary of the solid. Let S_1 and S_2 both be oriented upward.

   Provide an equation that relates $\int_{S_1} \underline{F} \cdot d\underline{S}, \int_{S_2} \underline{F} \cdot d\underline{S}, \int_W \nabla \cdot \underline{F}\, dV$.