1. **3.4.7, 3.4.13, 3.4.17.** (In 3.4.17, assume the set $V$ is open and simply connected.)

2. Let $U$ be an open subset of $\mathbb{R}^3$ with smooth boundary $\partial U$, and $u, v$ two smooth functions defined on $\mathbb{R}^3$. Show that

$$\int \int \int_U (u \nabla^2 v + \nabla u \cdot \nabla v) \, dx dy dz = \int \int_{\partial U} u \frac{\partial v}{\partial n} \, ds,$$

and

$$\int \int \int_U (u \nabla^2 v - v \nabla^2 u) \, dx dy dz = \int \int_{\partial U} (u \frac{\partial v}{\partial n} - v \frac{\partial u}{\partial n}) \, ds,$$

where $\overrightarrow{n}$ is the outward unit normal vector on $\partial U$. (Compare this with 3.4.33.)