Math 2934 homework

43. As many as needed from 17.9 # 1-14, including at least 1, 3, 11, 13. Also look at 19, 24 (notice that $2x + 2y + z^2 = (2\vec{\imath} + 2\vec{\jmath} + z\vec{k}) \cdot (x\vec{\imath} + y\vec{\jmath} + z\vec{k})$ and $(x\vec{\imath} + y\vec{\jmath} + z\vec{k})$ is the unit outward normal of $x^2 + y^2 + z^2 = 1$, so you can interpret $\iint_S 2x + 2y + z^2 \, dS$ as the integral of $2\vec{\imath} + 2\vec{\jmath} + z\vec{k}$ on S and apply the Divergence Theorem)

44. Study the nice chart on page 1141 of the book. Go back and look up the setup condition for each of the theorem, for example for the Divergence Theorem the surface S must be the entire boundary of the 3-dimensional region E, one must be using the outward unit normal on S, and the component functions of the vector field must have continuous (first partial) derivatives on E (strictly speaking, they are required to have continuous derivatives on some "open set" that contains E, but "continuous derivatives on E" is close enough for our purposes).