Special Problem A-5

In this problem, we are going to derive important relationships for spherical coordinates. Note that all of the answers to this problem can be found in appendix A of your textbook, so you must carefully show your work in order to get credit.

(a) Derive $\nabla \cdot \boldsymbol{v}$ in spherical coordinates

(b) Derive $\nabla \times \boldsymbol{v}$ in spherical coordinates

(c) Derive $\nabla \boldsymbol{v}$ in spherical coordinates