Exercise 10

Write out in full in Cartesian coordinates

$$\textbf{(a)} \quad \frac{\partial}{\partial t}\rho\mathbf{v} = -[\nabla \cdot \rho\mathbf{v}\mathbf{v}] - \nabla p - [\nabla \cdot \boldsymbol{\tau}] + \rho\mathbf{g}$$

$$\textbf{(b)} \quad \boldsymbol{\tau} = -\mu\left[\nabla\mathbf{v} + (\nabla\mathbf{v})^{\dagger} - \frac{2}{3}(\nabla \cdot \mathbf{v})\boldsymbol{\delta}\right]$$