Math 2415
Homework on 16.5

1. Compute the divergence and curl of the following vector fields

   (a) $\mathbf{F} = (x + yz)\mathbf{i} + (y + xz)\mathbf{j} + (z + xy)\mathbf{k}$.

   (b) $\mathbf{F} = \frac{x\mathbf{i}+y\mathbf{j}+z\mathbf{k}}{(x^2+y^2+z^2)^{3/2}}$

2. Let $\mathbf{F}$ be a vector of the form $\mathbf{F}(x, y, z) = f(x)\mathbf{i} + g(y)\mathbf{j} + h(z)\mathbf{k}$. Show that $\nabla \times \mathbf{F} = \mathbf{0}$.

3. Let $\mathbf{F}$ be a vector of the form $\mathbf{F}(x, y, z) = f(y, z)\mathbf{i} + g(x, z)\mathbf{j} + h(x, y)\mathbf{k}$. Show that $\nabla \cdot \mathbf{F} = 0$.

4. Problem 1 from http://mathquest.carroll.edu/libraries/MVC.student.20.01.pdf