1. Compute the work done by the vector field
\[ \mathbf{F} = (\sin z + xy^2, 2x^2y, x \cos z - z^2) \]
along the portion of helix \( x = \cos t, y = \sin t, z = t \) from \((1, 0, 0)\) to \((1, 0, 2)\).

2. Page 399, problem 10, 12.

3. Page 453, problem 1, 3, 4, 10, 12.

4. Show that \[ \nabla \times (f \mathbf{G}) = f \nabla \times \mathbf{G} + \nabla f \times \mathbf{G}, \]
for any field \( \mathbf{G} \) and any function \( f \).