Exercise 1.  (1) Let $F$ be the vector field defined by
\[ F(x, y, z) = (yz^3)i + (xy^2)j + (y^2z)k. \]
Compute $\text{Curl}(F)$ and $\text{div}(\text{Curl}(F))$.

(2) Let $G$ be the vector field defined by
\[ G(x, y, z) = (x + e^x)i + (y + y^3)j + (z + e^z)k. \]
Is there a vector field $H(x, y, z)$ such that $G = \text{Curl}(H)$?

Exercise 2. Using Green’s Theorem, evaluate the following line integral
\[ \oint_C 4xy^3\,dx + 7x^2y^2\,dy, \]
where $C$ is the positively oriented path which is the boundary of the region in the first quadrant bounded by $x = 1$, $y = x^2$ and the $x$-axis.