Question 1. (10 points) Evaluate the integral
\[ \int_{0}^{2} \int_{x}^{\sqrt{x}} e^{y^2} dy \, dx. \]

Question 2. (10 points) Find the volume in the cylinder defined by \( x^2 + y^2 = 4 \) which is below the plane \( y + z = 4 \) and above the plane \( z = 0 \).
Question 3. (10 points) Let $f(x, y) = e^{x \ln(x)} y^2 \sin(y)$. By using symmetries, calculate

$$\int_{-\pi}^{\pi} \int_{-2}^{y^2} f(x, y) dxdy.$$