1. Evaluate the double integral \( \iint_{R} x \sin(xy) \, dA \) over the region \( R = [0,1] \times [0,1] \).

2. Let \( D \) be the region defined by \( D = \{(x,y) | 0 \leq x \leq 1, 0 \leq y \leq x\} \), evaluate \( \iint_{D} x^2 \, dA \).
3. Change the order of integration of the following integral, do not evaluate.

\[ \int_{y=4}^{9} \int_{x=2}^{\sqrt{y}} \sqrt{4x^2 + 5y} \, dx \, dy \]

4. Evaluate the integral

\[ \int_{x=0}^{1} \int_{y=x}^{1} xe^{y^3} \, dy \, dx \]

by changing the order of integration.