

1. Evaluate $\iint_R -y \cos(xy) \, dA$ where $R = [1, 2] \times [0, \pi]$

2. Evaluate $\iint_R x\sqrt{xy} \, dA$ where $R = [1, 2] \times [0, 1]$

3. (a) What is the average value of $f(x) = x^3$ over the interval $[-1, 1]$?

Hint: Sketch the graph

(b) What is the average value of $f(x) = x^3 + 5$ over the interval $[-1, 1]$?

(c) What is the average value of a function $f(x)$ over the interval $[a, b]$?

(d) What is the average value of a function $f(x, y)$ over a rectangle R ?

(e) Find the average value of $y = -y \cos(xy)$ over the rectangle $R = [1, 2] \times [0, \pi]$