Worksheet: Double integrals over rectangles

1. Evaluate the double (iterated) integral:

$$\int_0^{\pi} \int_0^{\pi/2} \cos x \sin(3y)\, dx\, dy =$$

2. Evaluate the double (iterated) integral:

$$\int_1^2 \int_3^4 x^5 + y^6\, dy\, dx =$$

3. Write the integral as an iterated integral in the two different ways:

$$\iint_R e^{\cos(xy)} x^2\, dA \qquad \text{where } R = [0,1] \times [-1,1]$$

4. Apply the midpoint rule to estimate the integral. Use $m = 2$ points in the x-direction and $n = 2$ points in the y-direction

$$\iint_R \frac{1}{xy}\, dA \qquad \text{where } R = [1, 2] \times [1, 3]$$

5. Compute the integral in problem **4** exactly. How close is the midpoint rule estimate?