

1. Evaluate the following:

a.  $\int_2^4 \left( \int_1^9 y e^x dy \right) dx$

b.  $\int_{y=0}^4 \int_{x=0}^3 \frac{dx dy}{\sqrt{3x+4y}}$

2. Verify that  $\int_{y=0}^4 \int_{x=0}^3 \frac{dx dy}{\sqrt{3x+4y}} = \int_{x=0}^3 \int_{y=0}^4 \frac{dx dy}{\sqrt{3x+4y}}$

3. Find the volume between the graph of  $f(x, y) = 16 - x^2 - 3y^2$  and the rectangle  $R = [0, 3] \times [0, 1]$

4. Calculate  $\iint_R \frac{dA}{(x+y)^2}$ , where  $R = [1, 2] \times [0, 1]$

5. Evaluate the following:

a.  $\int_1^3 \int_0^2 x^3 y dy dx$

b.  $\int_{-1}^1 \int_0^\pi x^2 \sin y dy dx$

## 16.1 Integration in Two Variables

Day 2

Multivariable

c. 
$$\int_0^{\pi/4} \int_{\pi/4}^{\pi/2} \cos(2x + y) dy dx$$

d. 
$$\int_1^2 \int_2^4 e^{3x-y} dy dx$$

e. 
$$\int_0^8 \int_1^2 \frac{x dx dy}{\sqrt{x^2+y}}$$

f. 
$$\int_1^2 \int_1^3 \frac{\ln(xy) dy dx}{y}$$