

## 16.2: Integration Practice

### Calculus III

College of the Atlantic

1. Evaluate the following integrals:

$$\int_2^5 x^2 dx \quad (1)$$

$$\int_2^5 y^2 dy \quad (2)$$

$$\int_2^5 2x^2 dx \quad (3)$$

$$\int_2^5 \ln(2)x^2 dx \quad (4)$$

$$\int_2^5 yx^2 dx \quad (5)$$

$$\int_2^y x^2 dx \quad (6)$$

$$\int_2^x x^2 dx \quad (7)$$

2. Evaluate the following integrals:

$$\int_2^3 \sqrt{1+2x} dx \quad (8)$$

$$\int_0^4 x^4 e^{-x} dx \quad (9)$$

3. Evaluate the following integrals and sketch the region of integration:

$$\int_1^4 \int_0^2 dx dy \quad (10)$$

$$\int_0^3 \int_1^2 xy dx dy \quad (11)$$

$$\int_0^3 \int_1^2 xy dy dx \quad (12)$$

4. Let  $R$  be a triangular region with corners at  $(0, 0)$ ,  $(0, 4)$ , and  $(2, 0)$ . Write

$$\int_R xy dA, \quad (13)$$

as an iterated integral in two different ways and evaluate it.

5. Let  $R$  be the triangular region with corners at  $(0, 3)$ ,  $(1, 1)$ , and  $(5, 3)$ . Write the integral

$$\int_R 3xy^2 dA, \quad (14)$$

as an iterated integral and sketch the region of integration.

6. Let  $R$  be the region in the first quadrant bounded by the  $x$  and  $y$ -axes and the line  $x + 2y = 6$ . Write

$$\int_R \sqrt{x + 2y} dA, \quad (15)$$

as an iterated integral in two different ways and evaluate it.

7. Let  $R$  be the region bounded by  $y = \sqrt{x}$  and  $y = x^3$ . Evaluate

$$\int_R 4xy - y^3 dA, \quad (16)$$

and sketch the region of integration.