

Box # \_\_\_\_\_

Math 60

HW 8

Due May 26, 2016

**Problem 5.2.7**

Evaluate the given iterated integral. In addition, sketch the region  $D$  that is determined by the regions of integration.

$$\int_{-1}^3 \int_x^{2x+1} xy \, dy \, dx$$

**Problem 5.2.14**

Figure 5.43 shows the level curves indicating the varying depth (in feet) of a 25 ft by 50 ft swimming pool. Use a Riemann sum to estimate, to the nearest  $100 \text{ ft}^3$ , the volume of water that the pool contains.

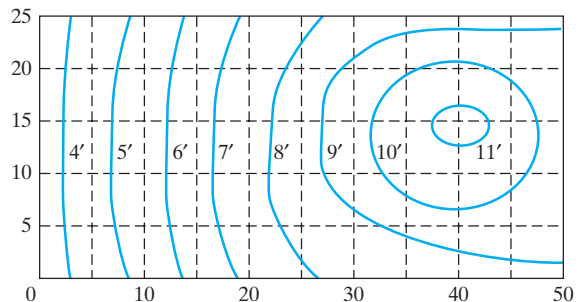


FIGURE 5.43

**Problem 5.3.1**

Consider the integral

$$\int_0^2 \int_{x^2}^{2x} (2x + 1) \, dy \, dx$$

- (a) Evaluate this integral
- (b) Sketch the region of integration
- (c) Write an equivalent iterated integral with the order of integration reversed. Evaluate this new integral and check that your answer agrees with part (a).

**Problem 5.3.13**

Rewrite the sum of iterated integrals as a single iterated integral by reversing the order of integration, and evaluate.

$$\int_0^8 \int_0^{\sqrt{\frac{y}{3}}} y \, dx \, dy + \int_8^{12} \int_{\sqrt{y-8}}^{\sqrt{\frac{y}{3}}} y \, dx \, dy$$

**Problem 5.3.18**

Evaluate the iterated integral

$$\int_0^2 \int_{\frac{y}{2}}^1 e^{-x^2} \, dx \, dy$$

**Problem 5.4.4**

Find the value of  $\iiint_W z \, dV$ , where  $W = [-1, 2] \times [2, 5] \times [-3, 3]$ , without resorting to explicit calculation.

**Problem 5.4.5**

Evaluate the iterated integral

$$\int_{-1}^2 \int_1^{z^2} \int_0^{y+z} 3yz^2 \, dx \, dy \, dz$$

**Problem 5.4.18**

Integrate the function  $f(x, y, z) = z$  over the region  $W$  bounded by  $z = 0$ ,  $x^2 + 4y^2 = 4$ , and  $z = x + 2$ .



**Problem 5.4.29ab**

Consider the integral

$$\int_{-2}^2 \int_0^{\frac{1}{2}\sqrt{4-x^2}} \int_{x^2+3y^2}^{4-y^2} (x^3 + y^3) \, dz \, dy \, dx$$

- (a) This integral is equal to a triple integral over a solid region  $W$  in  $\mathbb{R}^3$ . Describe  $W$ .
- (b) Set up an equivalent iterated integral by integrating first with respect to  $z$ , then with respect to  $x$ , then with respect to  $y$ . Do not evaluate your answer.