

**Section 15.2: Additional Problems**

1. Evaluate the integral where  $D = \{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 \leq 16\}$ .

$$\iint_D \sqrt{16 - x^2 - y^2} \, dA$$

2. Set up the double integral that will compute  $\iint_D f(x, y) \, dA$  where  $D$  is the region bounded by the curves  $y = x^2$  and  $x = y - 6$ .

3. Evaluate the double integral of  $f(x, y) = x$  over the region  $D = \{(x, y) \mid 0 \leq x \leq \pi, 0 \leq y \leq \sin(x)\}$ .

4. Example Change the order of integration.

$$\int_0^1 \int_{y^2}^{2-y} f(x, y) \, dx \, dy$$

5. Evaluate the integral  $\int_0^4 \int_{\sqrt{y}}^2 \sqrt{x^3 + 1} \, dx \, dy$ .

6. Find the volume of the solid bounded by the cylinder  $y^2 + z^2 = 36$ , the planes  $x = 0$ ,  $y = 0$ ,  $z = 0$ ,  $x + y = 10$  in the first octant.

7. Setup the integral that would give the volume of the solid (a tetrahedron) bounded by the planes  $y = 0$ ,  $z = 0$ ,  $x = 3y$  and  $x + y + z = 4$