Evaluate the integral

$$\int_0^2 \int_{x/2}^{(x/2)+1} x^5(2y-x)e^{(2y-x)^2}\, dy\, dx$$

by making the substitution $u = x$, $v = 2y - x$.

Find the total area enclosed inside the rose $r = \sin 2\theta$. (Hint: Sketch the curve and find the area inside a single leaf.)

Evaluate

$$\iint_D \cos(x^2 + y^2)\, dA,$$

where $D$ is the shaded region in Figure 5.106.

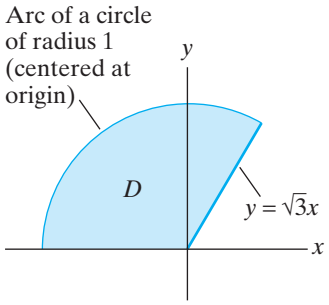


FIGURE 5.106. The region $D$ of Exercise 25.

Determine

$$\iiint_W (x^2 + y^2 + 2z^2)\, dV,$$

where $W$ is the solid cylinder defined by the inequalities $x^2 + y^2 \leq 4$, $-1 \leq z \leq 2$.

In Exercises 34 and 35, determine the values of the given integrals, where $W$ is the region bounded by the two spheres $x^2 + y^2 + z^2 = a^2$ and $x^2 + y^2 + z^2 = b^2$, for $0 < a < b$.

$$\iiint_W \frac{dV}{\sqrt{x^2 + y^2 + z^2}}$$

Determine

$$\iiint_W \left(2 + \sqrt{x^2 + y^2}\right) dV,$$

where $W = \left\{(x, y, z) | \sqrt{x^2 + y^2} \leq z/2 \leq 3\right\}$.