**5–18** Evaluate the surface integral.

**7.** $\iint_S yz\,dS$,
$S$ is the part of the plane $x + y + z = 1$ that lies in the first octant

**9.** $\iint_S yz\,dS$,
$S$ is the surface with parametric equations $x = u^2$, $y = u \sin v$, $z = u \cos v$, $0 \leq u \leq 1$, $0 \leq v \leq \pi/2$

**14.** $\iint_S y^2\,dS$,
$S$ is the part of the sphere $x^2 + y^2 + z^2 = 4$ that lies inside the cylinder $x^2 + y^2 = 1$ and above the $xy$-plane

**17.** $\iint_S (z + x^2 y)\,dS$,
$S$ is the part of the cylinder $y^2 + z^2 = 1$ that lies between the planes $x = 0$ and $x = 3$ in the first octant

**24.** $\mathbf{F}(x, y, z) = xz\,\mathbf{i} + x\,\mathbf{j} + y\,\mathbf{k}$,
$S$ is the hemisphere $x^2 + y^2 + z^2 = 25$, $y \geq 0$, oriented in the direction of the positive $y$-axis

**35.** Find a formula for $\iint_S \mathbf{F} \cdot d\mathbf{S}$ similar to Formula 10 for the case where $S$ is given by $y = h(x, z)$ and $\mathbf{n}$ is the unit normal that points toward the left.

**41.** A fluid has density 870 kg/m$^3$ and flows with velocity $\mathbf{v} = z\,\mathbf{i} + y^2\,\mathbf{j} + x^2\,\mathbf{k}$, where $x$, $y$, and $z$ are measured in meters and the components of $\mathbf{v}$ in meters per second. Find the rate of flow outward through the cylinder $x^2 + y^2 = 4$, $0 \leq z \leq 1$.