5-20 Evaluate the surface integral.

7. $\iint_S y\, dS$, S is the helicoid with vector equation $\mathbf{r}(u, v) = \langle u\cos v, u\sin v, v\rangle$, $0 \le u \le 1,\ 0 \le v \le \pi$
13. $\iint_S x\, dS$, S is the surface $y = x^2 + 4z,\ 0 \le x \le 1,\ 0 \le z \le 1$
17. $\iint_S (x^2 z + y^2 z)\, dS$, S is the hemisphere $x^2 + y^2 + z^2 = 4,\ 0 \le z$

21-32 Evaluate the surface integral $\iint_S \mathbf{F} \cdot d\mathbf{S}$ for the given vector field $\mathbf{F}$ and the oriented surface S. In other words, find the flux of $\mathbf{F}$ across S. For closed surfaces, use the positive (outward) orientation.

23. $\mathbf{F}(x, y, z) = \langle xy, yz, zx\rangle$, S is the part of the paraboloid $z = 4 - x^2 - y^2$ that lies above the square $0 \le x \le 1, 0 \le y \le 1$ and has upward orientation
27. $\mathbf{F}(x, y, z) = \langle 0, y, -z\rangle$, S consists of the paraboloid $y = x^2 + z^2,\ 0 \le y \le 1$ and the disk $x^2 + z^2 \le 1,\ y = 1$
31. $\mathbf{F}(x, y, z) = \langle x^2, y^2, z^2\rangle$, S is the boundary of the solid half-cylinder $0 \le z \le \sqrt{1 - y^2},\ 0 \le x \le 2$