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Verify Stokes' Theorem by computing both integrals.

5. S is the portion of $z = 4 - x^2 - y^2$ above the xy-plane, $\vec{F} = \langle zx, 2y, z^3 \rangle$.

Use Stokes' Theorem to compute $\iint_S (\nabla \times \vec{F}) \cdot \vec{n}\, dS$.

9. S is the portion of the tetrahedron bounded by $x + y + 2z = 2$ and the coordinate planes with $z > 0$, $\vec{n}$ is upward, $\vec{F} = \langle zy^4 - y^2, y - x^3, z^2 \rangle$.

13. S is the portion of the tetrahedron in exercise 9 with $y > 0$, $\vec{n}$ to the right, $\vec{F} = \langle zy^4 - y^2, y - x^3, z^2 \rangle$.

Use Stokes' Theorem to evaluate $\int_C \vec{F} \cdot d\vec{r}$.

21. C is the boundary of the portion of $z = 4 - x^2 - y^2$ above the xy-plane, $\vec{F} = \langle x^2 e^x - y, \sqrt{y^2 + 1}, z^3 \rangle$.

25. C is the triangle form (0, 1, 0) to (0, 0, 4) to (2, 0, 0), $\vec{F} = \langle x^2 + 2xy^3 z, 3x^2 y^2 z - y, x^2 y^3 \rangle$.