1. (16.6.6) Find the area of the paraboloid \( z = 4 - x^2 - y^2 \) that lies above the \( xy \)-plane.

2. (16.7.7) Evaluate the triple integral \( \iiint_E 2xdV \), where \( E = \{(x, y, z)|0 \leq y \leq 2, 0 \leq x \leq \sqrt{4 - y^2}, 0 \leq z \leq y\} \).

3. (16.8.19) Evaluate \( \iiint_E zdV \), where \( E \) is the region between the spheres \( x^2 + y^2 + z^2 = 1 \) and \( x^2 + y^2 + z^2 = 4 \) in the first octant.

4. (16.9.11) Use the given transformation to evaluate the integral \( \iint_R (x - 3y) \, dA \), where \( R \) is the triangular region with vertices \((0, 0), (2, 1), \) and \((1, 2)\); \( x = 2u + v, y = u + 2v \).

5. (17.2.1) Evaluate \( \int_C yds \), where \( C : x = t^2, y = t, 0 \leq t \leq 2 \).

6. (17.3.20) Show that the line integral is independent of path and evaluate the integral \( \int_C (1 - ye^{-x}) \, dx + e^{-x} \, dy \), where \( C \) is any path from \((0, 1)\) to \((1, 2)\).

7. (17.4.11) Use Green’s Theorem to evaluate the line integral along the given positively oriented curve. \( \int_C y^3 \, dx - x^3 \, dy \), where \( C \) is the circle \( x^2 + y^2 = 4 \).

8. (17.5.16) Given \( F = e^z i + j + xe^z k \). Determine whether or not \( F \) is conservative. If it is conservative, find a function \( f \) such that \( F = \nabla f \).

9. (17.6.37) Find the area of the surface \( z = xy \) that lies within the cylinder \( x^2 + y^2 = 1 \).

10. (17.7.7) Evaluate \( \iint_S yz \, dS \), where \( S \) is the part of the plane \( x + y + z = 1 \) that lies in the first octant.

11. (17.8.7) Use Stokes’ Theorem to evaluate \( \int_C F \cdot dr \), where \( F = (x + y^2)i + (y + z^2)j + (z + x^2)k \) and \( C \) is the triangle with vertices \((1, 0, 0), (0, 1, 0) \) and \((0, 0, 1)\), oriented counterclockwise as viewed from above.

12. (17.9.14) Use the divergence theorem to calculate the surface integral \( \iint_S F \cdot dS \), where \( F = x^4i - x^3z^2j + 4xy^2zk \), \( S \) is the surface of the solid bounded by the cylinder \( x^2 + y^2 = 1 \) and the planes \( z = x + 2 \) and \( z = 0 \).