In section 9.2 we calculated the surface area of a surface of revolution. In this section, we will calculate the surface area of a surface given by $z = f(x, y)$.

Area of a Surface: If f and its first partial derivatives are continuous on the closed region D in the $xy-$plane, then the **area of the surface** given by $z = f(x, y)$ over D is given by

$$A(S) = \iint_D \sqrt{1 + [f_x(x, y)]^2 + [f_y(x, y)]^2}\ dA$$

EXAMPLE 1: Find the area of the part of the surface $z = 1+3x+2y^2$ that lies above the triangle with vertices $(0, 0), (0, 1)$ and $(2, 1)$.

EXAMPLE 2: Find the area of the part of the surface of the paraboloid $z = 4 - x^2 - y^2$ that lies above the $xy-$plane.

Homework: pg 1058; 1–9 odd