

### Section 15.6 Surface Area

The area of surface given by the equation  $z = f(x, y)$ ,  $(x, y) \in D$  is

$$A(S) = \iint_D \sqrt{f_x^2 + f_y^2 + 1} \, dA.$$

If  $D$  is a polar region, convert to polar coordinates after setting up the integral.

**Example 1** Find the surface area of the part of the surface  $z = x^2 + 2y$  that lies above the triangular region  $T$  with vertices  $(0, 0)$ ,  $(1, 0)$  and  $(1, 1)$ .

**Example 2** Find the surface area of the part of the paraboloid  $z = x^2 + y^2$  that lies under the plane  $z = 9$ .

HW: 3, 5, 7, 9, 11