§22

Let $\Sigma_{f,R}$ be the portion of the graph of $f(x,y)$ – remember the graph of $f(x,y)$ means $f(x,y) = z$ – that lies above (or below) the region R in the xy-plane.

$$\text{Surface Area}\left(\Sigma_{f,R}\right) = \iint_R \sqrt{\left(\frac{\partial f}{\partial x}\right)^2 + \left(\frac{\partial f}{\partial y}\right)^2 + 1}\, dA$$