

$$\boxed{\phi(x, y, z) = z}$$

given  $2z + x + 2y = 12$

$$z = \frac{12 - x - 2y}{2}$$

$$\boxed{\phi_x = z_x = -\frac{1}{2}}$$

$$\& \boxed{\phi_y = z_y = -1}$$

map

Since  $\underline{\text{Surface area}} = S = \iint_R \sqrt{1 + (\phi_x)^2 + (\phi_y)^2} \, dx \, dy$

$$= \int_0^1 \int_0^1 \sqrt{1 + \left(-\frac{1}{2}\right)^2 + (-1)^2} \, dx \, dy$$

$$\left[ \begin{array}{l} R\text{-}xy \text{ plane} \\ 0 < x < 1 \\ 0 < y < 1 \end{array} \right] \text{ [given]}$$

$$\Rightarrow \int_0^1 \int_0^1 \sqrt{1 + \frac{1}{4} + 1} \, dx \, dy \Rightarrow \frac{3}{2} \int_0^1 [x]_0^1 \, dy \Rightarrow \boxed{\frac{3}{2}}$$