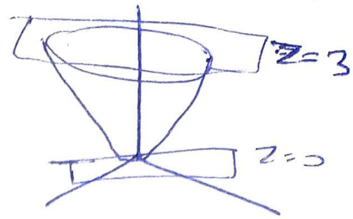
$$S = \quad z = \sqrt{3}\sqrt{(x^2+y^2)}$$



$$\iint_S (x^2+y^2)\,dS = \iint_S (x^2+y^2)\sqrt{1+\left(\frac{\partial z}{\partial x}\right)^2+\left(\frac{\partial z}{\partial y}\right)^2}\,dx\,dy$$

$$= \iint_S (x^2+y^2)\sqrt{1+\left(\frac{\sqrt{3}}{\cancel{2}\sqrt{x^2+y^2}}\times 1 \times \cancel{2}x\right)^2+\left(\frac{\sqrt{3}\times\cancel{2}y}{\cancel{2}\sqrt{x^2+y^2}}\right)^2}\,dx\,dy$$

$$= \iint_D (x^2+y^2)\sqrt{1+\frac{3x^2}{x^2+y^2}+\frac{3y^2}{x^2+y^2}}\,dx\,dy$$

$$\Rightarrow \iint_D (x^2+y^2)\sqrt{\frac{x^2+y^2+3x^2+3y^2}{x^2+y^2}}\,dx\,dy$$

$$\Rightarrow \iint_D \sqrt{x^2+y^2}\times\sqrt{4x^2+4y^2}\,dx\,dy$$

$$\Rightarrow 2\iint_D (x^2+y^2)\,dx\,dy$$

$$D:\ x^2+y^2 = \frac{z^2}{3} = \frac{9}{3} = 6$$

$$\Rightarrow 2\int_{\theta=0}^{2\pi}\int_{r=0}^{\sqrt{6}} r^3\,dr\,d\theta$$

$$\Rightarrow \frac{2}{4}\left[r^4\right]_0^{\sqrt{6}}\times 2\pi \Rightarrow \frac{1}{\cancel{2}}\times\cancel{2}\,\pi\times 36 = \boxed{36\pi}$$