

934.

$$K = \left\{ (x, y, z) : x^2 + z^2 \leq a^2, y^2 + z^2 \leq a^2 \right\}$$

$$\text{Arean} = \iint_S dA = 16 \iint_{D_{xy}} dA$$

$$D_{xy} = \left\{ (x, y) : 0 \leq x \leq |a|, 0 \leq y \leq x \right\}$$

$$\text{En normal ges av : } \vec{\mathbf{n}} = \text{grad}(x^2 + z^2 - a^2) = (2x, 0, 2z).$$

$$\text{En enhetsnormal : } \hat{\mathbf{n}} = \frac{(x, 0, z)}{\sqrt{x^2 + z^2}} = \frac{(x, 0, z)}{|a|} = \frac{(x, 0, \sqrt{a^2 - x^2})}{|a|}.$$

$$\cos \theta = \frac{\sqrt{a^2 - x^2}}{|a|}$$

$$\text{Area} = 16 \int_{D_{xy}} \frac{|a| dx dy}{\sqrt{a^2 - x^2}}$$

$$\text{Area} = 16|a| \int_{x=0}^{|a|} \left(\int_{y=0}^x \frac{dy}{\sqrt{a^2 - x^2}} \right) dx = 16|a| \int_{x=0}^{|a|} \frac{x}{\sqrt{a^2 - x^2}} dx$$

$$\text{Area} = 16|a| \left[-\sqrt{a^2 - x^2} \right]_{x=0}^{|a|} = 16|a|(|a|) = 16a^2$$