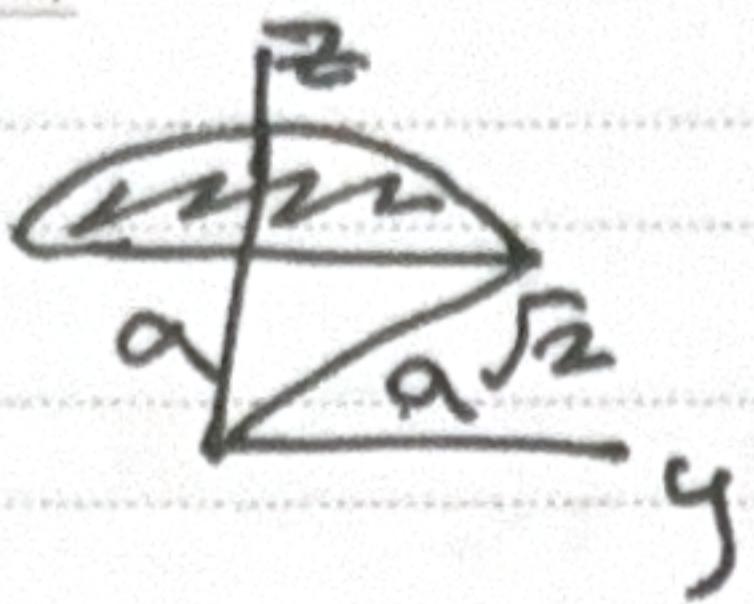
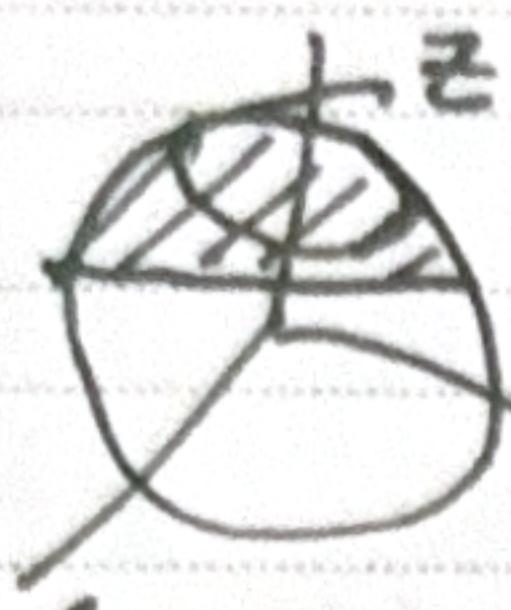


1.



$$\int_{0}^{2\pi} \int_{0}^{\frac{\pi}{4}} \int_{0}^{a\sqrt{2}} e^z \sin\theta d\rho d\phi d\theta$$

$a\sqrt{2} \cos\phi$

$$\text{Inner } \Delta = \frac{a^3 \sqrt{2} \sin\theta}{3} - \frac{a^3}{3 \cos^3\theta}$$

$$\text{Middle } = -\frac{a^3 \sqrt{2} \cos\theta \frac{\pi}{4}}{3} - \frac{a^3}{3 \cos^3\theta} \Big|_0^{\frac{\pi}{4}} = \frac{2\sqrt{2}a^3}{3} - \frac{5a^3}{6}$$

$$\text{Outer } = 2\pi \left( \frac{\sqrt{2} \cdot 2 \cdot a^3}{3} - \frac{5a^3}{6} \right) = 0.7a^3$$

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$$\begin{vmatrix} u_x & v_x & w_x \\ u_y & v_y & w_{xy} \\ u_z & v_z & w_z \end{vmatrix} = P^2 \sin\theta$$