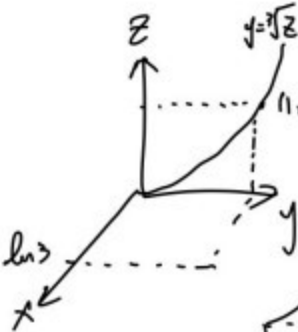
43. $x=\ln 3$

$x=0$

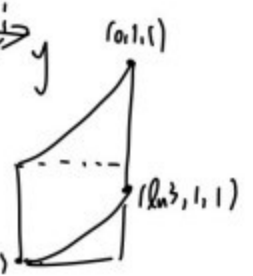
$y=1$

$y=\sqrt[3]{z} \Rightarrow y^3=z$

$z=1$, $z=0$



44.



$$\int_0^1 \int_0^{\ln 3} \int_0^{y^3} \frac{z e^{2x} \sin z y^2}{y^2} \, dz \, dx \, dy$$

$$= \int_0^1 \int_0^{\ln 3} z e^{2x} \sin(zy^2) y \, dx \, dy$$

$$= \int_0^1 \frac{z}{z} y \sin(zy^2) e^{2x} \Big|_0^{\ln 3} \, dy$$

$$= \int_0^1 \frac{z}{z} y \sin(zy^2)(9-1) \, dy$$

$$= \frac{8}{z} z \int_0^1 y \sin(zy^2) \, dy = \frac{-8z}{z} \frac{1}{2z} \cos(zy^2) \Big|_0^1$$

$$= -2(\cos z - \cos 0) = 4$$