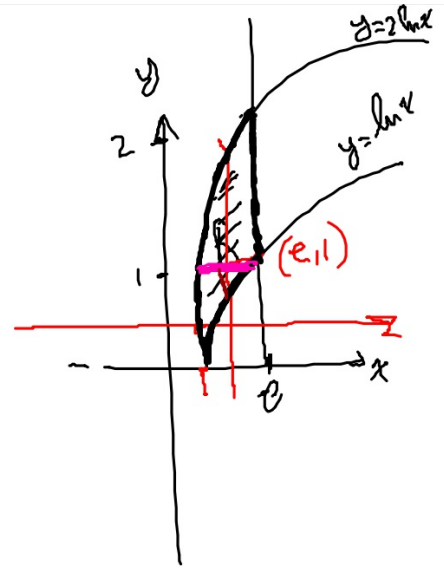


(6)

$$\text{Area} = \iint_R dA$$

$$= \int_1^e \int_{\ln x}^{2 \ln x} dy dx = \int_1^e \ln x dx$$

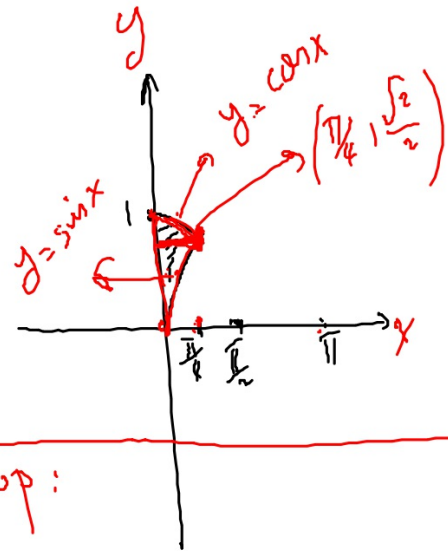
$$= \left[x \ln x - x \right]_1^e = 1$$



Extra: $A = \int_0^1 \int_{e^y}^{e^2} dx dy + \int_1^2 \int_{e^{y/2}}^e dx dy$

15) $\int_0^{\pi/4} \int_{\sin x}^{\cos x} dy dx$

a) $= \int_0^{\pi/4} (\cos x - \sin x) dx$
 $= \left[\sin x + \cos x \right]_0^{\pi/4} = \sqrt{2} - 1.$



b) Change the order of integration + set up:

$$I = \int_0^{\sqrt{2}/2} \int_0^{\sin^{-1} y} dx dy + \int_{\sqrt{2}/2}^1 \int_0^{\cos^{-1} y} dx dy$$