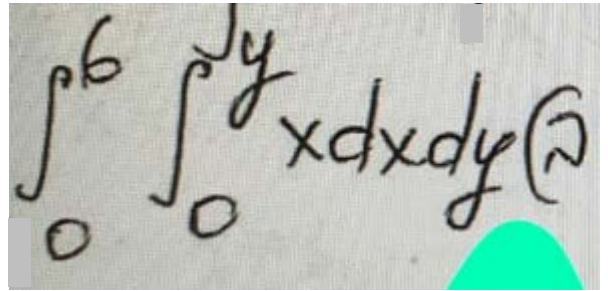
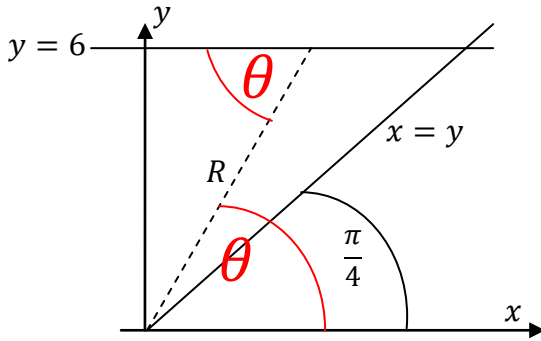


יש לחשב את האינטגרל הבא הן במערכת xy והן במערכת $r\theta$

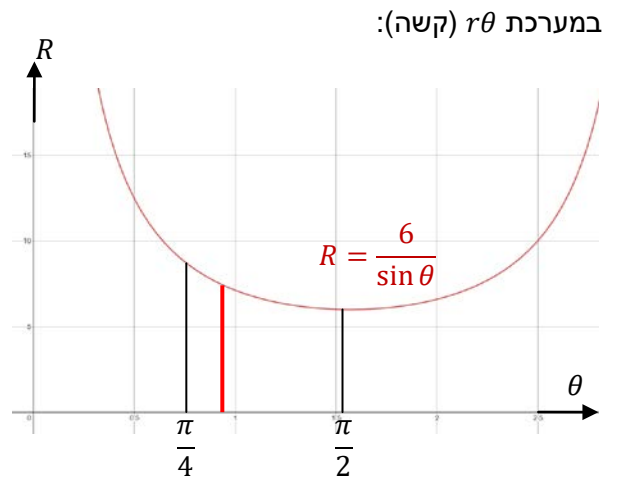


במערכת xy (קל):

$$\int_0^6 \int_0^y x dx dy = \frac{1}{2} \int_0^6 [x^2]_0^y dy = \frac{1}{2} \int_0^6 y^2 dy = \frac{1}{6} [y^3]_0^6 = 36$$

$$\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \int_0^{\frac{6}{\sin \theta}} r \cos \theta r dr d\theta = \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cos \theta d\theta \int_0^{\frac{6}{\sin \theta}} r^2 dr$$

$$\int_0^{\frac{6}{\sin \theta}} r^2 dr = \frac{1}{3} [r^3]_0^{\frac{6}{\sin \theta}} = \frac{1}{3} \cdot \frac{216}{\sin^3 \theta} = \frac{72}{\sin^3 \theta}$$



$$72 \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{1}{\sin^3 \theta} \cos \theta d\theta \rightarrow \begin{matrix} u = \sin \theta \\ du = \cos \theta d\theta \end{matrix} = 72 \int_{\frac{\sqrt{2}}{2}}^1 \frac{1}{u^3} du = -36 \left[\frac{1}{u^2} \right]_{\frac{\sqrt{2}}{2}}^1 = -36(1 - 2) = 36$$