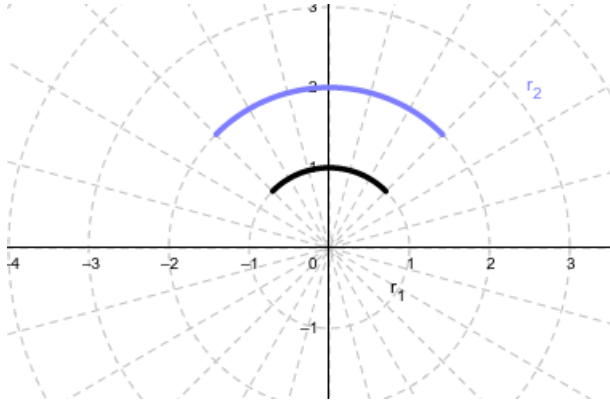


$$1. \int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} \int_1^2 r dr d\theta$$

$$D = \{(x, y, z) \in \mathbb{R}^3 :$$

- $\frac{\pi}{4} \leq \theta \leq \frac{3\pi}{4}$
- $1 \leq r \leq 2$

$$\}$$


$$\begin{aligned} \int_1^2 r dr &= \\ \left. \frac{r^2}{2} \right|_1^2 &= \\ 2 - \frac{1}{2} &= \frac{3}{2} \end{aligned}$$

$$\begin{aligned} \int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} \frac{3}{2} d\theta &= \\ \left. \frac{3\theta}{2} \right|_{\frac{\pi}{4}}^{\frac{3\pi}{4}} &= \\ \frac{9\pi}{8} - \frac{3\pi}{8} &= \\ \frac{6\pi}{8} &= \frac{3\pi}{4} \end{aligned}$$

$$2. \int_{\frac{\pi}{2}}^{\pi} \int_0^{2\sin(\theta)} r dr d\theta$$

$$D = \{(x, y, z) \in \mathbb{R}^3 :$$

- $0 \leq r \leq 2\sin(\theta)$
- $\frac{\pi}{2} \leq \theta \leq \pi$

$$\}$$

Media circunferencia con centro en $(1, 1)$

$$\begin{aligned} \int_0^{2\sin(\theta)} r dr &= \\ \left. \frac{r^2}{2} \right|_0^{2\sin(\theta)} &= \\ 2\sin^2(\theta) & \end{aligned}$$

$$\begin{aligned} 2 \int_{\frac{\pi}{2}}^{\pi} \sin^2(\theta) d\theta &= \\ \theta \Big|_{\frac{\pi}{2}}^{\pi} &= \\ \frac{\pi}{2} & \end{aligned}$$