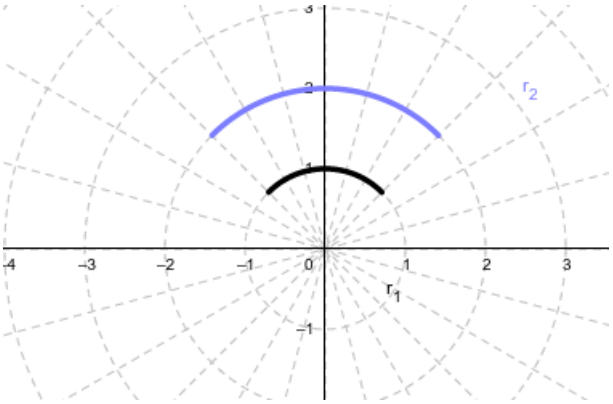
1. $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} \int_1^2 r dr d\theta$

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

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

   $\}$



   - $\int_1^2 r dr =$
     $\frac{r^2}{2}\Big|_1^2 =$
     $2 - \frac{1}{2} = \frac{3}{2}$
   - $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} \frac{3}{2} d\theta =$
     $\frac{3\theta}{2}\Big|_{\frac{\pi}{4}}^{\frac{3\pi}{4}} =$
     $\frac{9\pi}{8} - \frac{3\pi}{8} =$
     $\frac{6\pi}{8} = \frac{3\pi}{4}$

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 $(1, 1)$

   - $\int_0^{2\sin(\theta)} r dr =$
     $\frac{r^2}{2}\Big|_0^{2\sin(\theta)} =$
     $2\sin^2(\theta)$
   - $2\int_{\frac{\pi}{2}}^{\pi} \sin^2(\theta) d\theta =$
     $\theta\Big|_{\frac{\pi}{2}}^{\pi} =$
     $\frac{\pi}{2}$