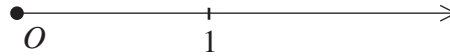
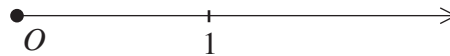


Quiz**Name**

1. Use the polar function $r = f(\theta) = \frac{1}{\sin \theta}$ and its graph to evaluate the integral $\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \frac{5}{\sin^2 \theta} d\theta$. Illustrate the meaning of the integral on in the polar plane below.



2. In the context of Problem 1 evaluate the integral $\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \sqrt{f(\theta)^2 + f'(\theta)^2} d\theta$. Illustrate the meaning of this integral on in the polar plane below.



3. Consider the equiangular spiral in the polar plane given by $r = f(\theta) = e^\theta$ with $\theta \geq 0$. Consider the first two complete revolutions of the spiral and compute the total length, first “on the nose”, then by providing a numerical estimate.