Lecture 31

Wednesday, March 5, 2025 12:26 AM

1) Graph the curve $r = \sin \theta$, $0 \le \theta \le 2\pi$ 2) Find the intersection of two polar curves $r = \sin 2\theta$ and $r = \sin \theta$.



At the intersection point, the polar coordinates (r_1, θ_1) along the first curve are equivalent to the polar coordinates (r_2, θ_2) along the second curve. We have $r_1 = \sin 2\theta_1$ and $r_2 = \sin \theta_2$. For these polar coordinates to be equivalent, one of the three following scenarios

must happen:

- Either $r_1 = r_2$ and $\theta_1 = \theta_2 + k2\pi$
- $r_1 = -r_2$ and $\theta_1 = \theta_2 + \pi + k2\pi$
- $r_1 = r_2 = 0$ and θ_1, θ_2 are arbitrary