

Polar Graph Test

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1. Find the intersections of $r = a \sin \theta + b \cos \theta$ with the standard x and y axis for $\theta \in [0, \pi)$ in both polar and cartesian coordinates.
2. Sketch $r = a \sin \theta + b \cos \theta$ for $[0, 2\pi)$ (indicate identifying points).
3. Find the set of points that are the intersections of $r = a \cos(n\theta)$ and $r = a$ for $\theta \in [0, 2\pi)$
4. Write the equations, in polar, of the distinct lines of symmetry of the equation $r^2 = a^2 \sin(2\theta)$.
5. Sketch $r = 2 - 3 \sin \theta$ on $\theta \in [0, 2\pi)$ (indicate identifying points).
6. Convert the equation $\frac{4x}{3x^2 + 3y^2} = 6 - x$ to polar.
7. Convert $6r^3 \sin \theta = 4 - \cos \theta$ to cartesian coordinates.
8. Find the tangent line to the curve of $r = \cos 3\theta$ at its farthest point from the pole in the second quadrant.
9. Identify the type of algebraic curve described by $r^2 = \sec(2\theta)$ for $\theta \in [0, 2\pi)$.
10. Identify the polar axis of symmetry for the curve $r^2 = a^2 \cos(\frac{\pi}{2} - 2\theta)$.