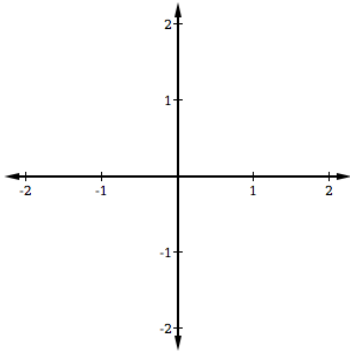


Lesson 9.3: Polar Area & Arc Length

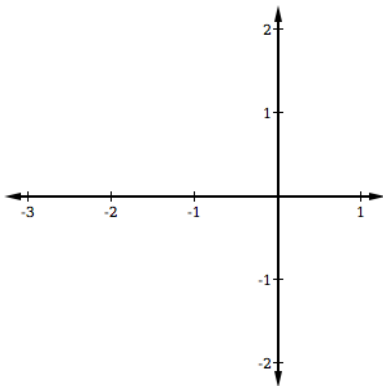
Examples:

1. Find the area of one petal of the curve $r = 3\cos(3\theta)$.



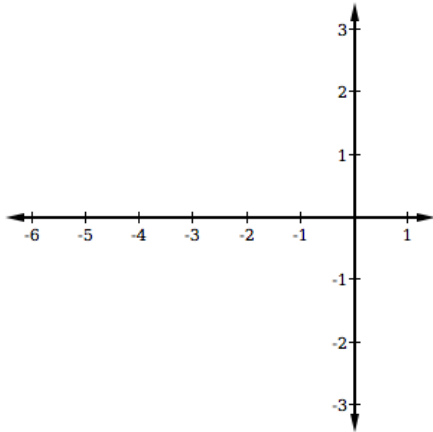
Intersections of Polar Graphs

2. Find the points of intersection of the graphs $r = 1 - 2\cos(\theta)$ and $r = 1$.

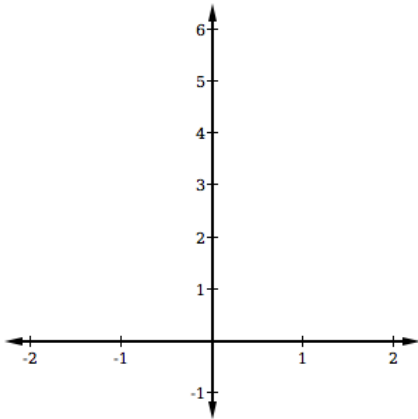


Area Between Two Curves

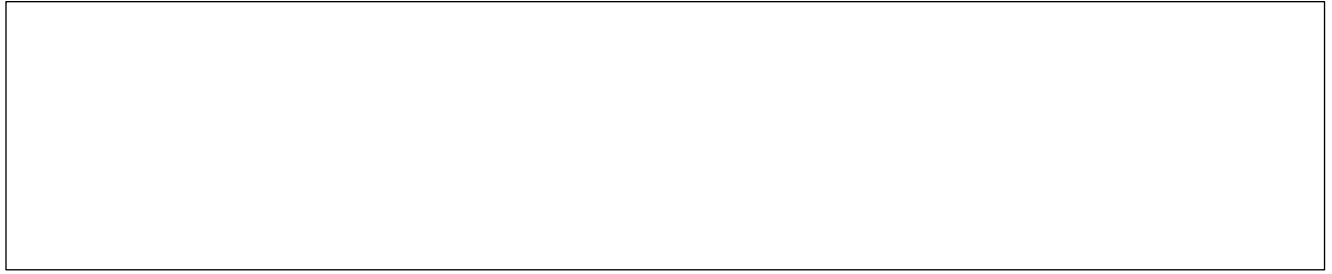
3. Find the area of the region common to the two regions bounded by $r = -6\cos(\theta)$ and $r = 2 - 2\cos(\theta)$.



4. Find the area between the loops of $r = 2(1 + 2\sin(\theta))$.



Polar Arc Length



Example:

1. Find the length of the arc from $\theta = 0$ to $\theta = 2\pi$ for the curve $r = 2 - 2\cos(\theta)$.