

Math 213 Class 11: Polar Coordinates #1

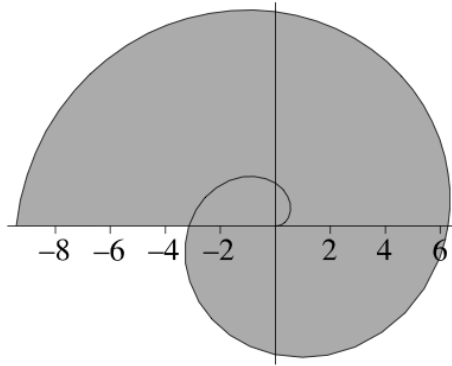
1. Integrate $f(x, y) = x^2 + y^2$ over $D = \{(x, y) : 1 \leq x^2 + y^2 \leq 4\}$ using polar coordinates.

2. Sketch the region of integration and evaluate by changing to polar coordinates.

$$\int_0^3 \int_0^{\sqrt{9-y^2}} \sqrt{x^2 + y^2} \, dx \, dy$$

Math 213 Class 11: Polar Coordinates #2

1. Find the area of the region inside the curve $r = \theta$, $0 \leq \theta \leq 3\pi$.



2. Rewrite $\int_{-2}^2 \int_0^{\sqrt{4-x^2}} e^{-x^2-y^2} dy dx$ as a polar integral and evaluate it.