

Math 143 Set 10

1. Plot these polar functions:

- a. $r = \theta$ for $\theta \in [-\pi, \pi]$,
- b. $r = \sin \theta$ for $\theta \in [0, \pi]$.
- c. $r = 1 - 2 \cos \theta$ for $\theta \in [0, 2\pi]$.

2. Find the equation of the line tangent to the polar curve at the given point:

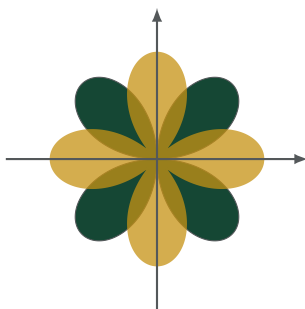
- a. $r = 2 \sin 2\theta$ at $\theta = 3\pi/4$.
- b. $r = 1/\theta$ at the x, y coordinate $(0, 2/\pi)$.

3. Find the points on the polar curve where the tangent line has a horizontal or a vertical tangent:

- a. $r = 1 + \cos \theta$.
- b. $r = 4$

4. Find the area swept out by the polar equation $r = \sqrt{\theta}$ for $\theta \in [0, 2\pi]$.

5. Find the area enclosed by the graph of $r = \sin(2\theta)$ but outside the graph of $r = \cos(2\theta)$:



6. Find the exact length of the polar curve

- a. $r = 3 \sin \theta$ for $\theta \in [0, \pi/3]$.
- b. $r = e^{2\theta}$ for $\theta \in [0, 2\pi]$.
- c. $r = \cos \theta + \sin \theta$ for $\theta \in [0, \pi]$.