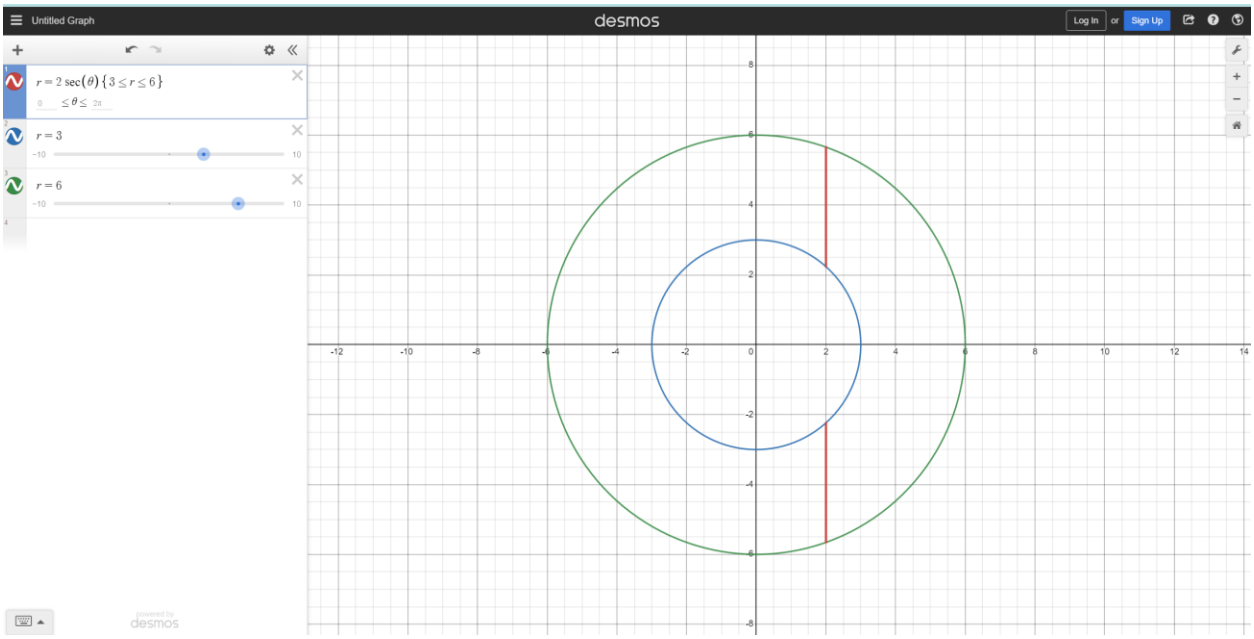
Math Calculus III

Name: Udaya Vijay Anand

Partner: Taeha Song

1).



2).

a).

$$x = r\cos(\theta) \quad y = r\sin(\theta)$$

$$y = r\sin(\theta)$$

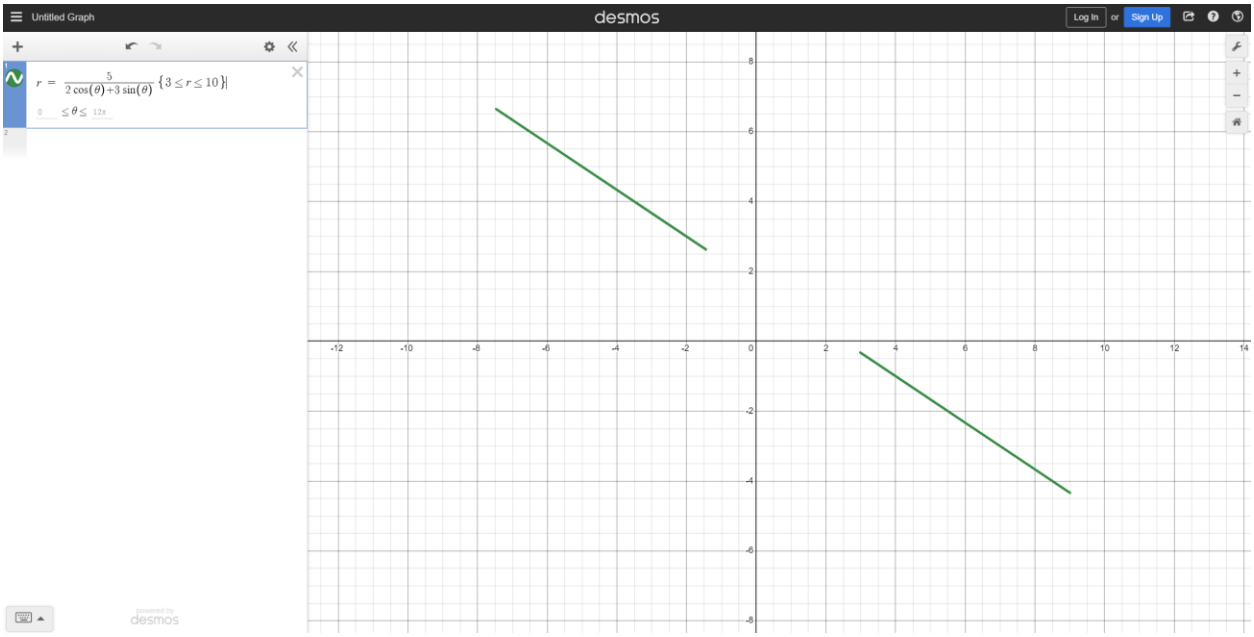
$$2x + 3y = 5$$

$$2(r\cos(\theta)) + 3(r\sin(\theta)) = 5$$

$$r\left[2(\cos(\theta)) + 3(\sin(\theta))\right] = 5$$

$$r = \frac{5}{2(\cos(\theta)) + 3\sin(\theta)}$$

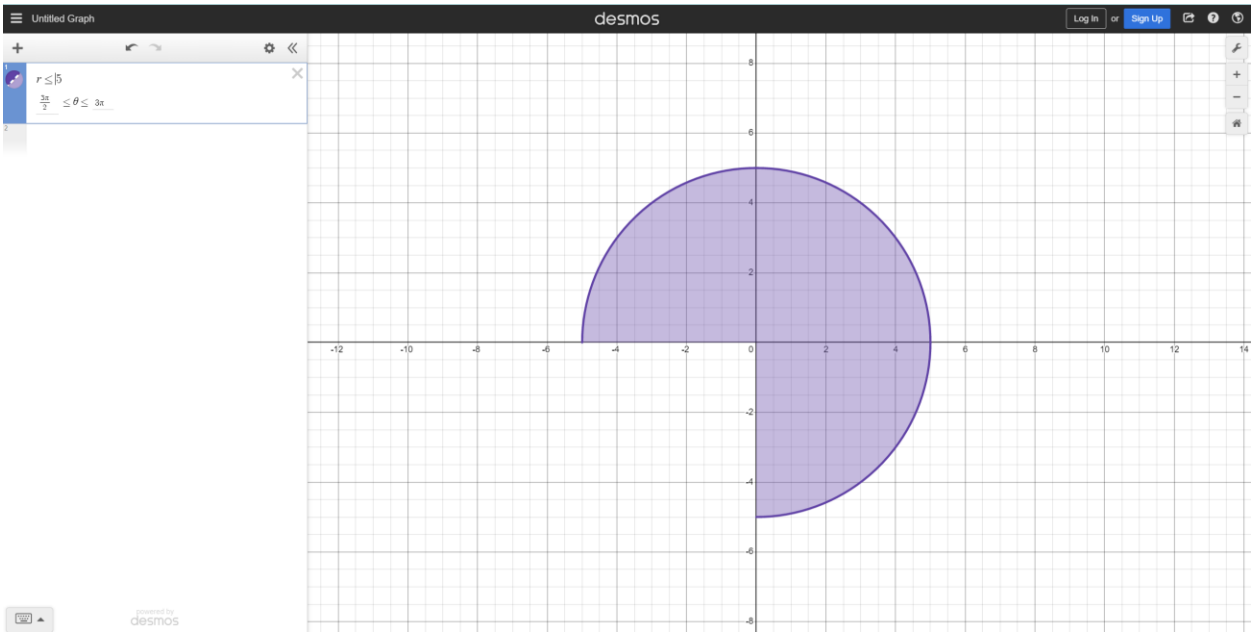
b).



$\therefore\ a = 3 \qquad b = 10$

3).

a).



$\therefore\ Radius = 5 \qquad Diameter = 10$

b).

Interval Coordinates:

$$\pi \leq \theta \leq \frac{5\pi}{2}$$

$$2 \leq \theta \leq 5$$

$$\{a, b, c, d\} = \{\pi, \frac{5\pi}{2}, 2{,}5\}$$

4).

a).

Interval Coordinates:

$$0 \leq \theta \leq \pi$$

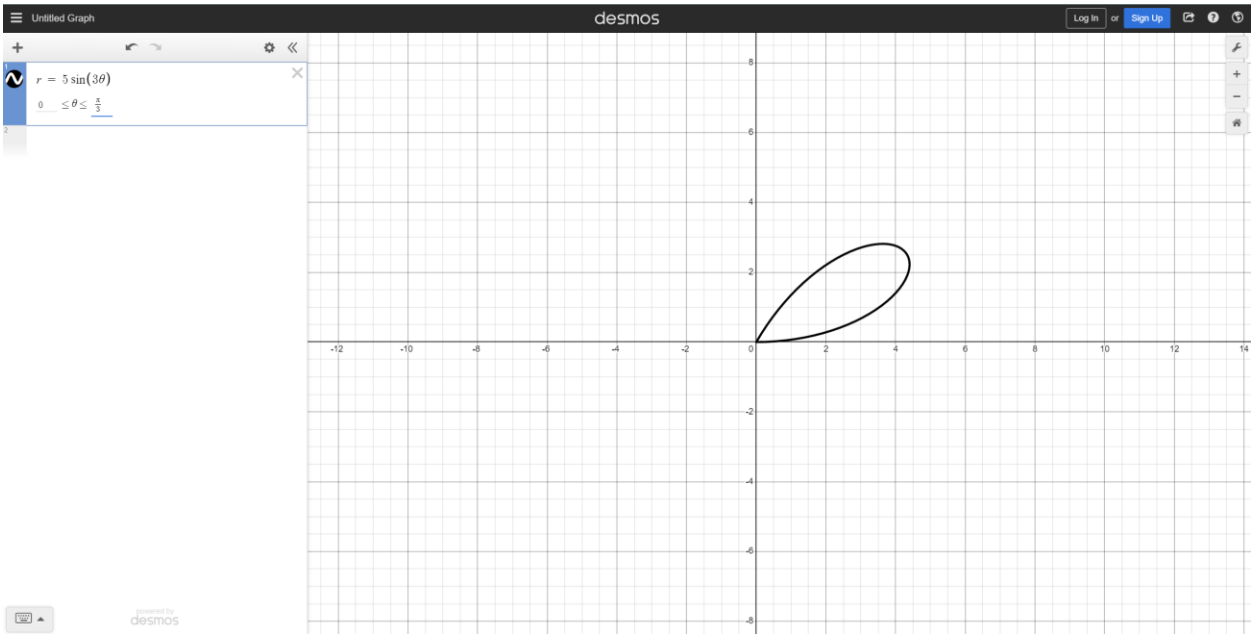
$$\sin(\theta) = 0$$

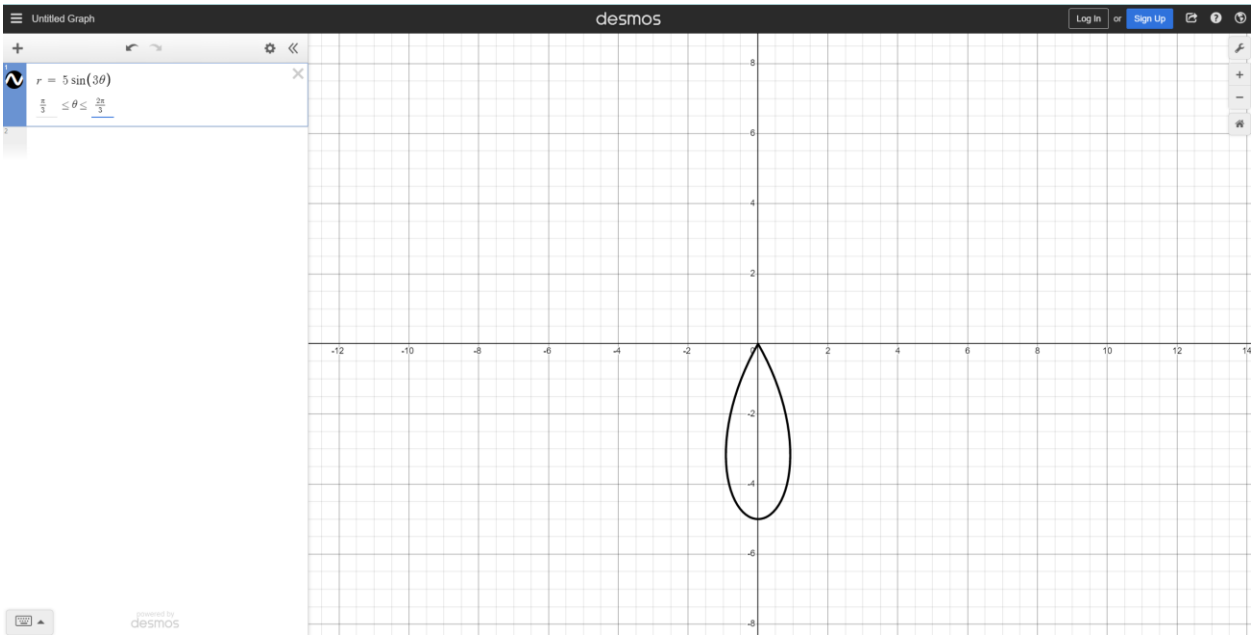
$$\sin(\theta) = 0 \quad at \quad \theta = 0, \pi, 2\pi \ldots$$

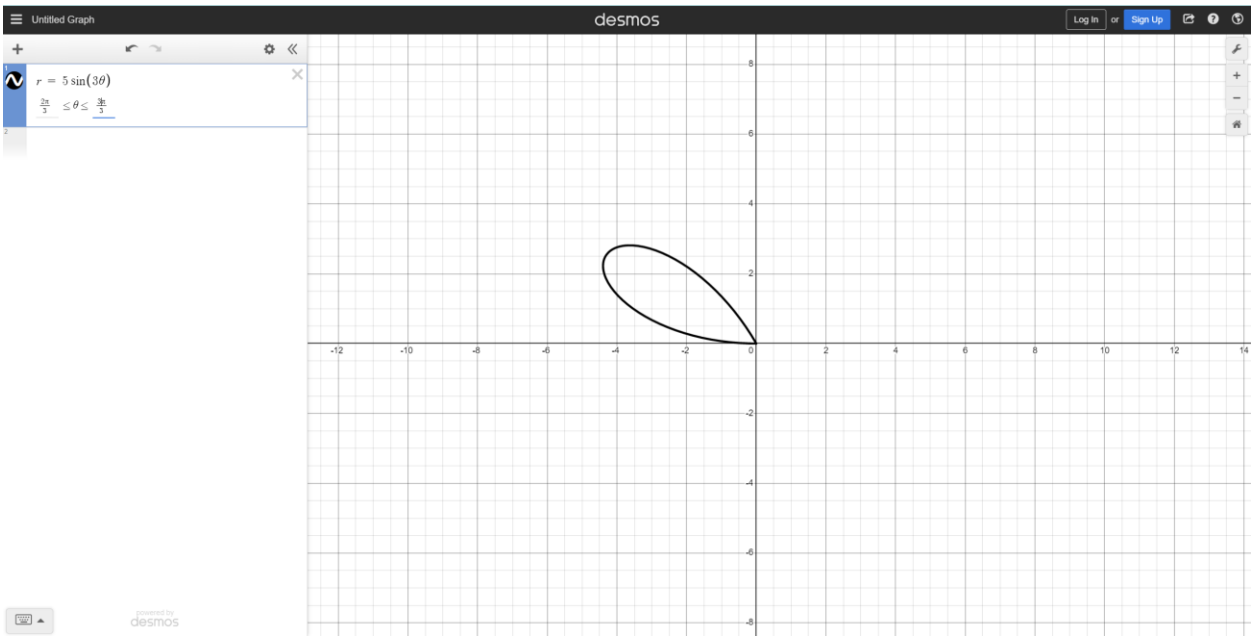
$$\sin(3\theta) = 0 \quad at \quad \theta = 0, \frac{\pi}{3}, \frac{2\pi}{3} \ldots$$

$$r = \cos(3\theta) = 0 \quad at \quad \theta = 0, \frac{\pi}{3}, \frac{2\pi}{3}, \pi$$

b).







The Petal in the 1st Quadrant is traced out as $\left\{0 \le \theta \le \frac{\pi}{3}\right\}$, *and it lies above the x axis*

The Petal in the 2nd Quadrant is traced out as $\{\frac{\pi}{3} \le \theta \le \frac{2\pi}{3}\}$, *and it lies above the* $x-$ *axis*

The petal in the 3rd quadrant is traced out as $\left\{\frac{2\pi}{3} \le \theta \le \pi\right\}$, *and it lies below the* $x-$ *axis*

The petal in the 4th quadrant is traced out as $\{\pi \le \theta \le \frac{4\pi}{3}\}$, *and it lies below the* $x-$ *axis*

The petal along the negative x axis is traced out as $\{\frac{4\pi}{3} \le \theta \le \frac{5\pi}{3}\}$