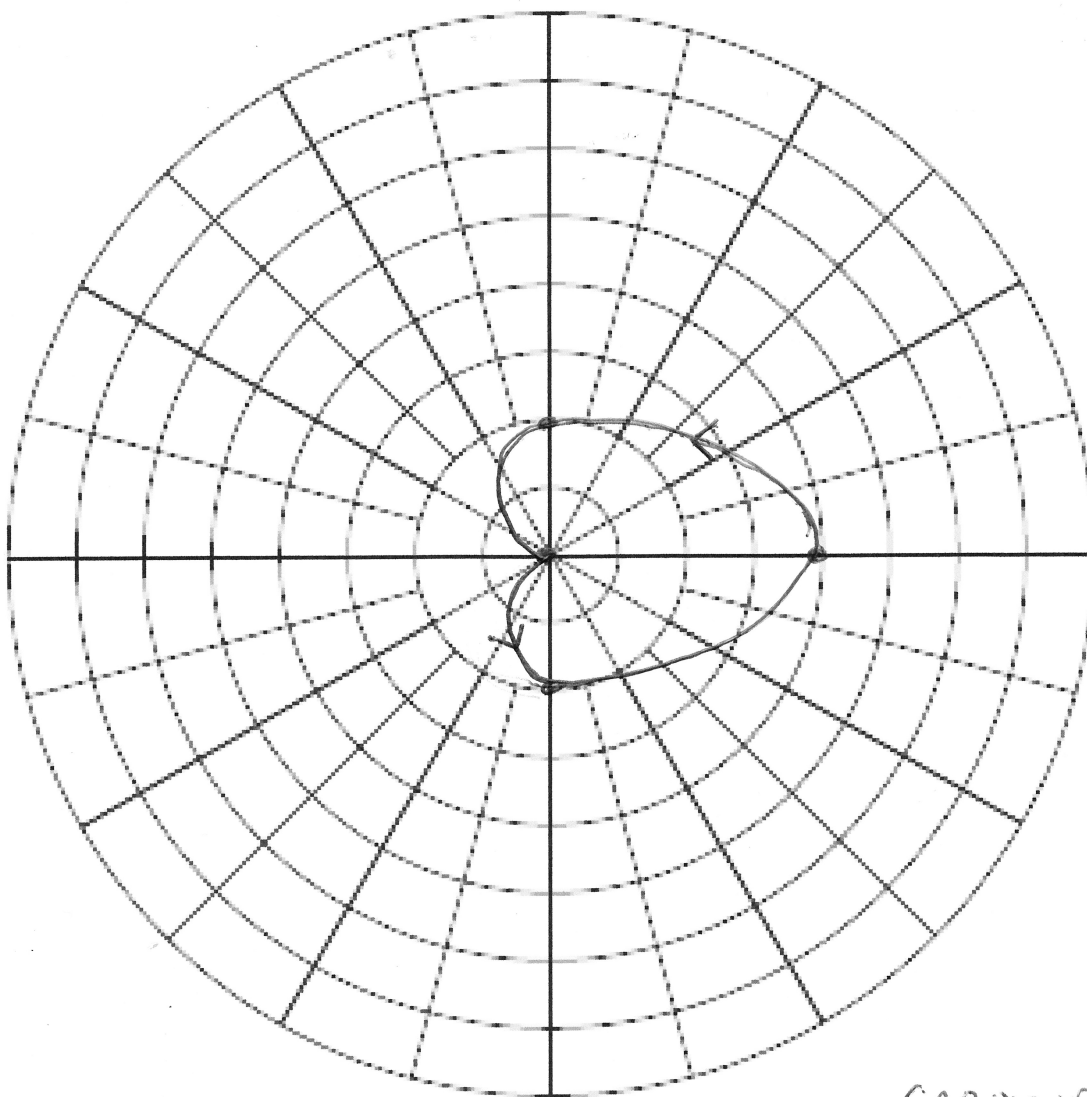


Calculus Study Guide: 11.3

Sketch the graph of $r = (\cos \theta) - 1$ on $(0, 2\pi)$.

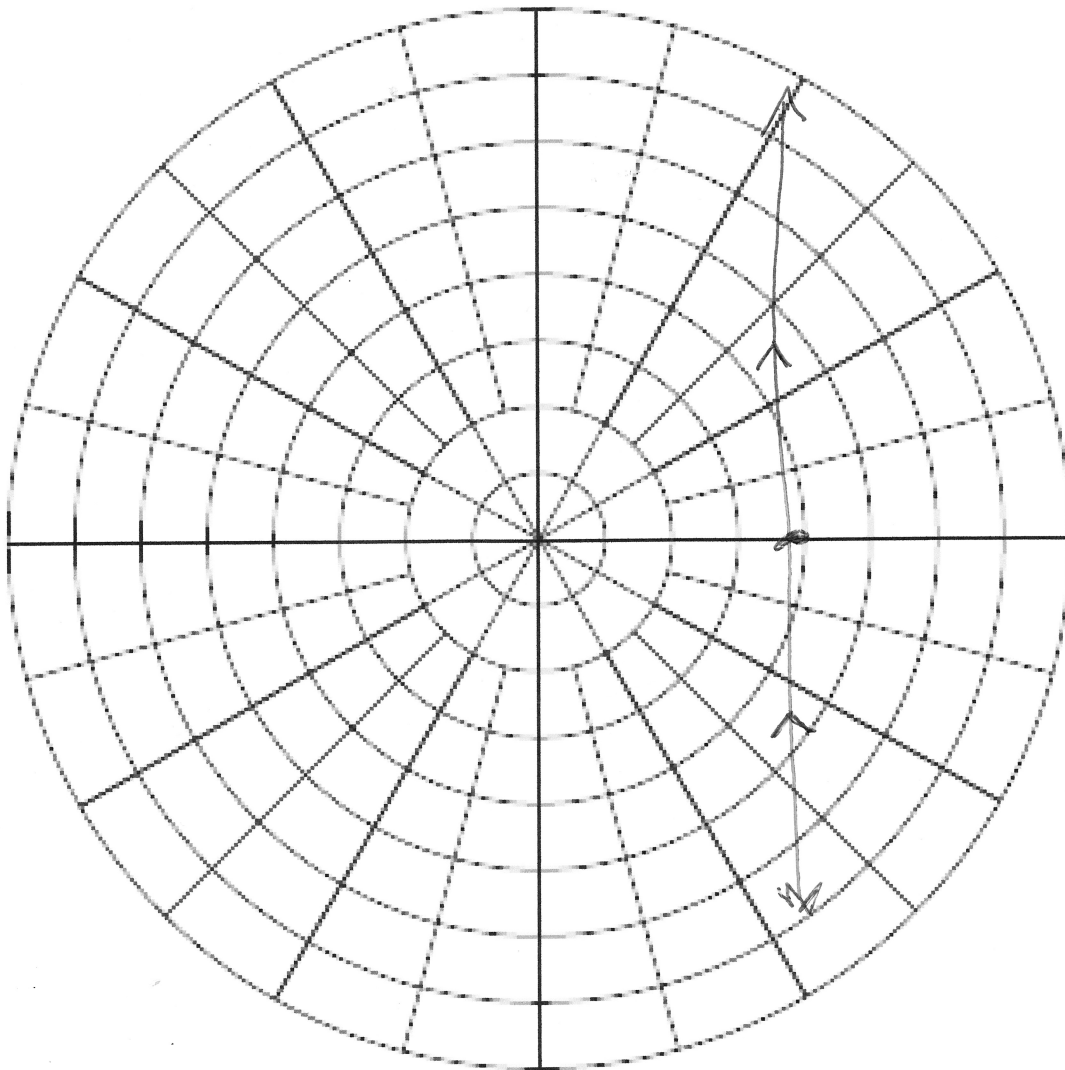
θ	r
0	0
$\frac{\pi}{2}$	-1
π	-2
$\frac{3\pi}{2}$	-1



CARDIoid

Sketch the graph of $r = 2 \sec \theta$ on $(-\pi/2, \pi/2)$.

θ	r
0	2
$-\pi/2$	$-\infty$
$\pi/2$	∞
$-\pi/4$	$-2\sqrt{2}$
$\pi/4$	$2\sqrt{2}$



STRAIGHT
LINE
 $x = 2$

Convert from rectangular coordinates to polar coordinates: (4, 3).

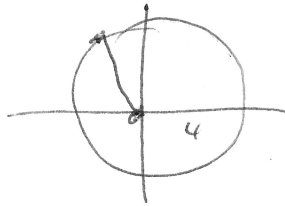
$$r = \sqrt{16+9} = 5$$

$$\tan \theta = \frac{3}{4}$$

$$\theta = \tan^{-1} \frac{3}{4} = 0.643$$

$$(5, 0.643)$$

Convert from polar to rectangular: $(4, 2\pi/3)$.



$$y = r \sin \theta = 4 \sin 2\pi/3 = \frac{4\sqrt{3}}{2} = 2\sqrt{3}$$

$$x = r \cos \theta = 4 \cos 2\pi/3 = 4(-\frac{1}{2}) = -2$$

$$(-2, 2\sqrt{3})$$

What is the slope of the line $\theta = \pi/3$?

$$\tan \theta = \frac{y}{x} = m$$

$$\tan \pi/3 = \sqrt{3} = \text{slope } (m)$$