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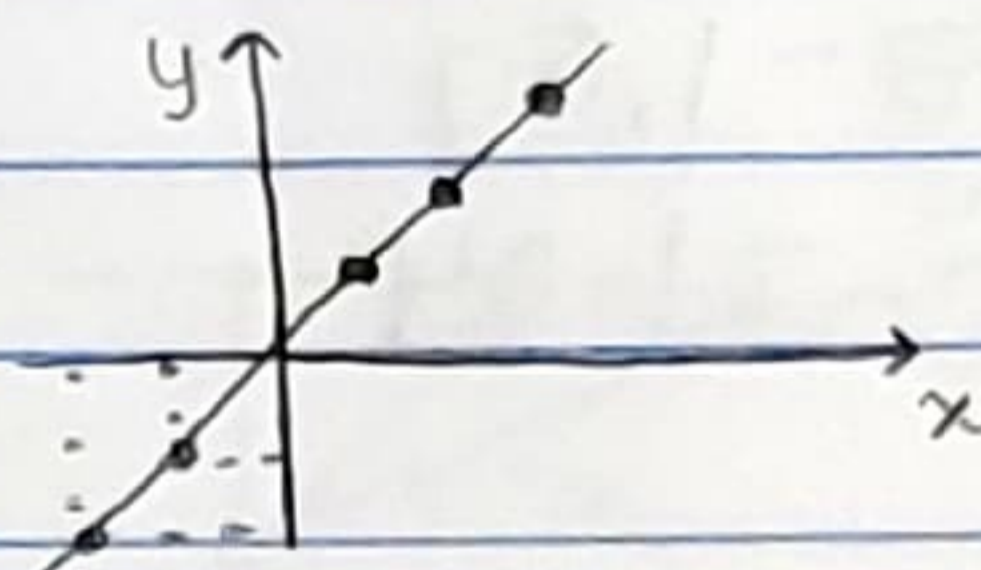
## Relaxing the $r$ for Graphing Purposes

### \*Curve

Any graph of a function is a curve.

$$y = f(x)$$

$$y = x$$



$y = f(x)$ : tell us how  $y$ -coord is related to  $x$ -coord

$$y = \ln(\sin x)$$

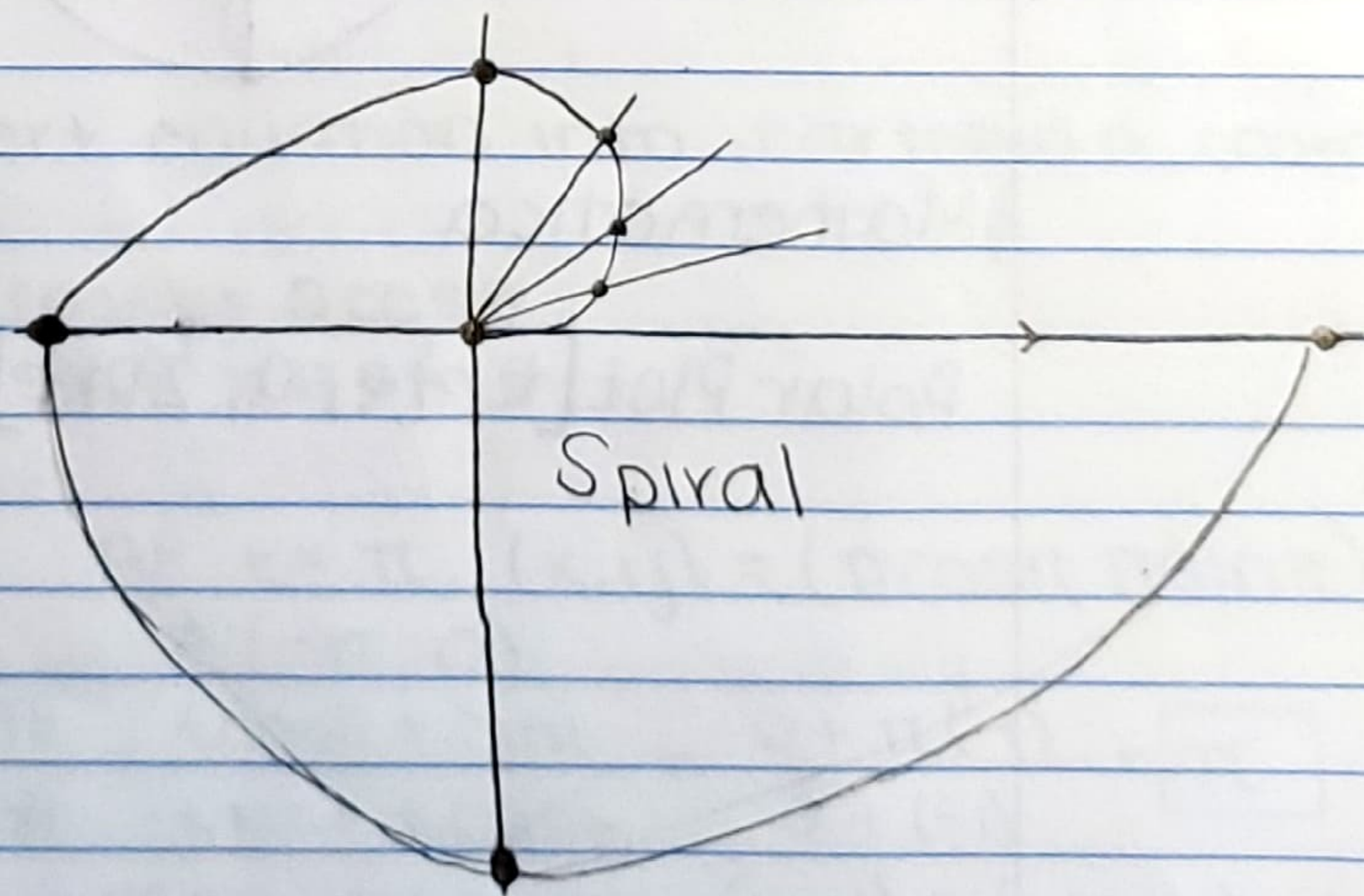
$$(r, \theta)$$

$\theta = f(r)$ : more difficult to draw

or  $r = f(\theta)$  easier to draw

ex. Sketch the curve  $r = \theta$ ,  $\theta \in [0, 2\pi]$ .

$\theta$	$r$
0	0
$\pi/6$	$\pi/6 \approx 0.5$
$\pi/4$	$\pi/4 \approx 0.78$
$\pi/3$	$\pi/3 \approx 1.04$
$\pi/2$	$\pi/2 \approx 1.57$
$\pi$	$\pi \approx 3.14$
$3\pi/2$	$3\pi/2 \approx 4.71$
$2\pi$	$2\pi \approx 6.28$

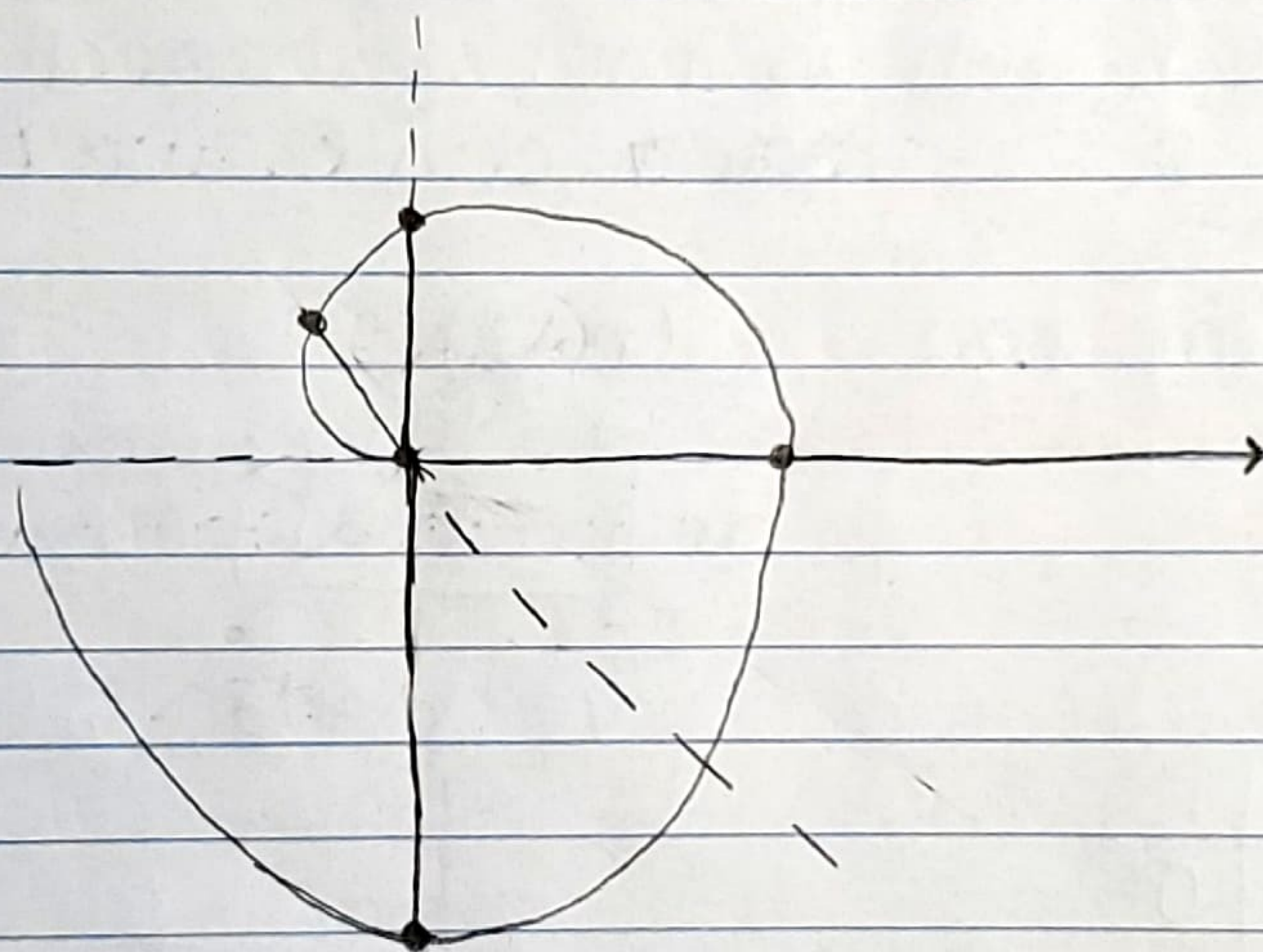




ex. Sketch the curve  $r = \theta$ ,  $\theta \in [-2\pi, 0]$

$\theta$	$r$
$-2\pi$	$-2\pi \approx -6.28$
$-\frac{3\pi}{2}$	$-\frac{3\pi}{2} \approx -4.71$
$-\pi$	$-\pi \approx -3.14$
$-\frac{\pi}{2}$	$-\frac{\pi}{2} \approx -1.57$
$-\frac{\pi}{3}$	$-\frac{\pi}{3} \approx -1.04$
$0$	$0$

Start outside in



Mathematica

PolarPlot[t, {t, 0, 2Pi}]