

||

$$\begin{matrix} (2, \frac{\pi}{3}) \\ r \quad \theta \end{matrix} \rightarrow (-1, \sqrt{3})$$

$$x^2 + y^2 = r^2$$

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

$$\begin{aligned} x &= r \cos \theta \\ y &= r \sin \theta \end{aligned}$$

$$\begin{aligned} x &= 2 \cos \frac{\pi}{3} = 2 \left(\frac{1}{2} \right) = 1 \\ y &= 2 \sin \frac{\pi}{3} = 2 \left(\frac{\sqrt{3}}{2} \right) = \sqrt{3} \end{aligned}$$

$$(-\sqrt{3}, -1)$$

Q3

$$x^2 + y^2 = r^2$$

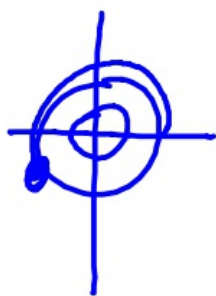
$$(-\sqrt{3})^2 + (-1)^2 = r^2$$

$$3 + 1 = r^2$$

$$r^2 = 4$$

$$r = \pm 2$$

$$(2, 210^\circ)$$



$$\tan \theta = \frac{-1}{-\sqrt{3}}$$

$$\tan \theta = \frac{1}{\sqrt{3}}$$

$$\theta = 210^\circ$$

$$r \cdot r = 3 \csc \theta \cdot r$$

$$r = 3 \csc \theta$$

$$\sin \theta \cdot r = 3 \cdot \frac{1}{\sin \theta} \cdot \sin \theta$$

$$y = 3$$

$$r \cdot r = 4 \cos \theta \cdot r$$

$$r^2 = 4r \cos \theta$$

$$x^2 + y^2 = 4x$$

$$[x^2 - 4x + 4] + y^2 = 0 + 4$$

$$\frac{1}{2}(-4)$$

$$(-2)^2$$

$$4$$

$$(x-2)^2 + y^2 = 4$$

$$x=5$$

$$r \cos \theta = 5$$

$$r = 5 \cdot \frac{1}{\cos \theta}$$

$$r = 5 \sec \theta$$

petals

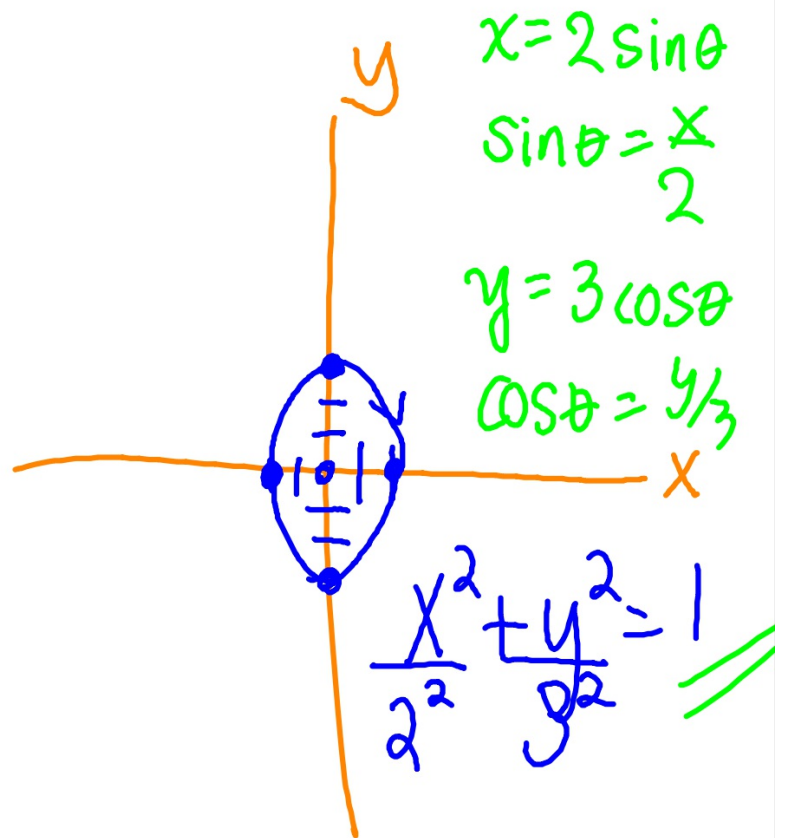
$$r = 4 \sin(3\theta)$$

$$4 \sin(10\theta)$$

20

$$\begin{cases} x = 2 \sin \theta \\ y = 3 \cos \theta \end{cases}$$

θ	x	y
0	0	3
$\frac{\pi}{2}$	2	0
π	0	-3
$\frac{3\pi}{2}$	-2	0
2π	0	3



$$\tan \theta = \frac{y}{x} \quad \left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right) \quad \cancel{x^2 + y^2 = r^2}$$

$$\tan \theta = \sqrt{3}$$

$$\frac{y}{x} = \sqrt{3}$$

$$y = \sqrt{3}x \quad \text{line}$$

$$\cancel{x = r \cos \theta}$$

$$\cancel{y = r \sin \theta}$$

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

$$r^2 = 4r \cos \theta$$

$$x^2 + y^2 = 4x$$

$$(1, 2) \rightarrow (r, \theta)$$

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

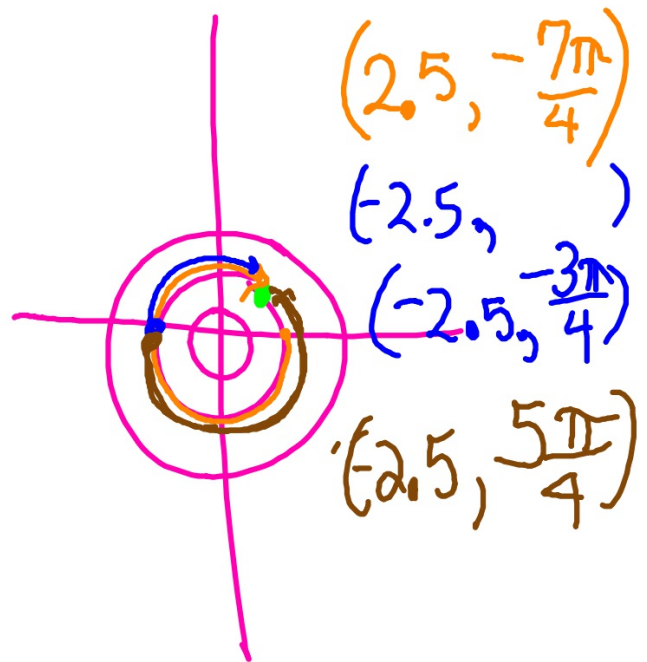
$$x = r \cos \theta \checkmark$$

~~$$y = r \sin \theta$$~~

$$x^2 + y^2 = r^2 \checkmark$$

$$(2.5, \frac{17\pi}{4})$$

$$\frac{17\pi}{4} - \frac{8\pi}{4}$$
$$\frac{9\pi}{4} - \frac{8\pi}{4}$$
$$\frac{\pi}{4}$$



$$r = 5 \cos(3\theta)$$

petals

$$r = 10 \cos(4\theta)$$

↓
2(4)
8

$$\#21 \quad 5x^2 + 5y^2 = 7$$

$$5(x^2 + y^2) = 7$$

$$(x^2 + y^2) = \frac{7}{5}$$

$$r^2 = \frac{7}{5}$$

$$r = \pm \sqrt{\frac{7}{5}}$$

$$x^2 + y^2 = r^2$$

$$\#25 \quad r^2 = r \sin \theta$$

$$x^2 + y^2 = y$$

$$x^2 + y^2 - y + \frac{1}{4} = 0 + \frac{1}{4}$$

$$x^2 + \left(y - \frac{1}{2}\right)^2 = \frac{1}{4}$$

$$\#22 \quad y^2 = 3x$$

$$(r \sin \theta)^2 = 3r \cos \theta$$

$$r^2 \sin^2 \theta = 3r \cos \theta$$

$$r^2 \sin^2 \theta - 3r \cos \theta = 0$$

$$r (r \sin^2 \theta - 3 \cos \theta) = 0$$

$$\cancel{r=0} \quad r \sin^2 \theta - 3 \cos \theta = 0$$

$$r \sin^2 \theta = \frac{3 \cos \theta}{\sin^2 \theta}$$

$$r = 3 \frac{\cos \theta}{\sin \theta} \cdot \frac{1}{\sin \theta}$$

$$r = 3 \cot \theta \csc \theta$$

$$x = 5 \sin \theta$$
$$y = 2 \cos \theta$$

$$\sin \theta = \frac{x}{5}$$

$$\cos \theta = \frac{y}{2}$$

$$\cos^2 \theta + \sin^2 \theta = 1$$

$$\left(\frac{y}{2}\right)^2 + \left(\frac{x}{5}\right)^2 = 1$$

$$\frac{y^2}{4} + \frac{x^2}{25} = 1$$

$$\star x = t + 1$$

$$y = 3(\star) - 2$$

$$t = x - 1$$

$$y = 3t - 2$$

$$y = 3(x - 1) - 2$$

$$y = 3x - 5$$

$$x^2 + y^2 = r^2$$

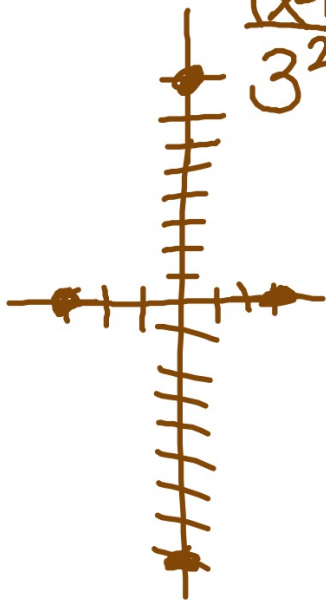
$$x = r \cos \theta$$

$$y = r \sin \theta$$

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

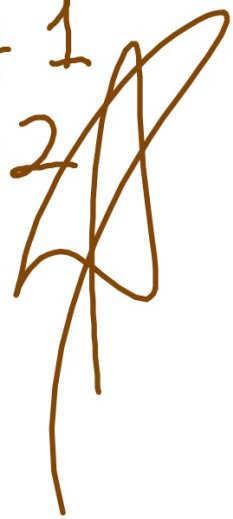
Write the parameterization

for $\frac{(x-1)^2}{3^2} + \frac{(y+2)^2}{8^2} = 1$



$$x = 3 \cos \theta + 1$$

$$y = 8 \sin \theta - 2$$



$(3, 25^\circ)$ to rect
pt.

$$x = r \cos \theta$$

$$x = 3 \cos 25^\circ$$

$$x = \underline{\hspace{2cm}}$$

$$y = r \sin \theta$$

$$y = 3 \sin 25^\circ$$

$$\left(3 \cos 25^\circ, 3 \sin 25^\circ \right)$$

