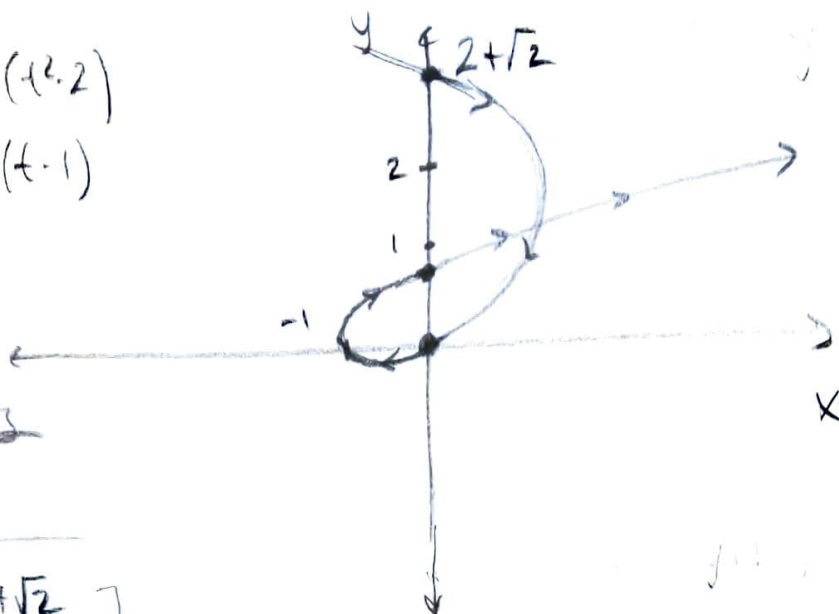


Graph 1

$$x = t^3 - 2t = t(t-2)$$

$$y = t^2 - t = t(t-1)$$



Axis intercepts

t	x	y
$-\sqrt{2}$	0	$2+\sqrt{2}$
0	0	0
1	-1	0
$\sqrt{2}$	0	$2-\sqrt{2}$

Note that the graphs don't give you these values (I'm cheating and using the equations).

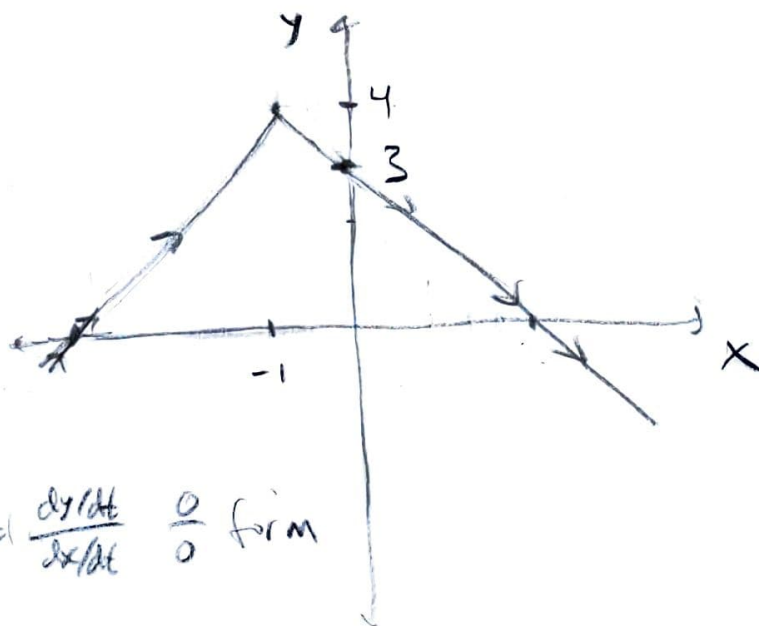
Graph 2

$$x = t^3 - 1$$

$$y = 4 - t^2$$

Axis intercepts

t	x	y
-2	-9	0
0	-1	4
1	0	3
2	7	0



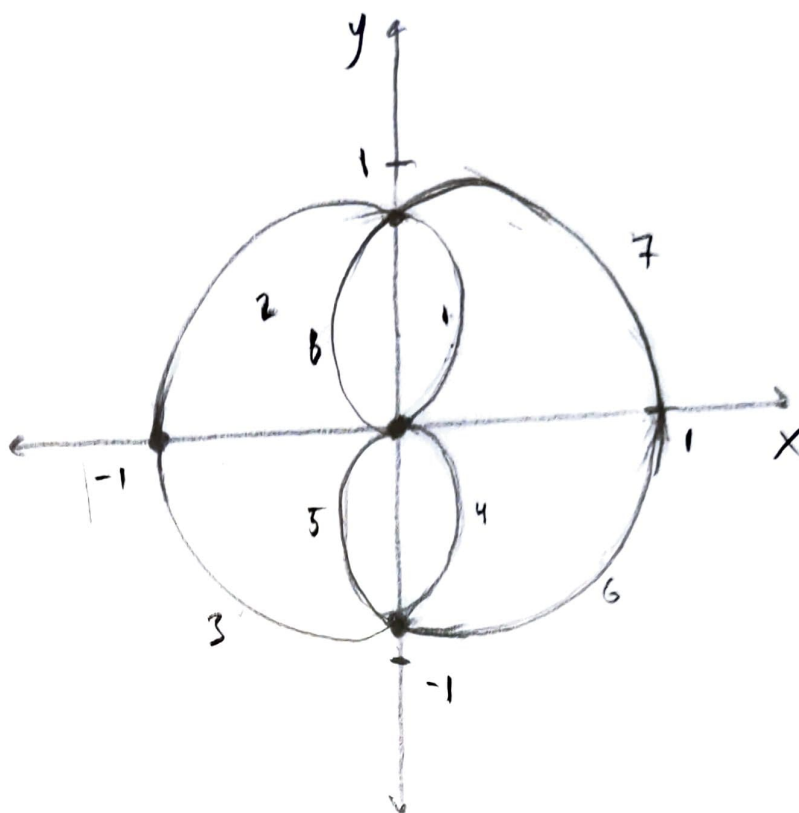
$$\frac{dy}{dx} = \frac{dy/dt}{dx/dt} = \frac{0}{0} \text{ form}$$

Graph 3

$$r = \sin\left(\frac{\theta}{2}\right)$$

Axis intercepts

θ	$r = \sin\left(\frac{\theta}{2}\right)$
0	0
$\frac{\pi}{2}$	$\frac{\sqrt{2}}{2}$
π	1
$\frac{3\pi}{2}$	$\frac{\sqrt{2}}{2}$
2π	0
$\frac{5\pi}{2}$	$-\frac{\sqrt{2}}{2}$
3π	-1
$\frac{7\pi}{2}$	$-\frac{\sqrt{2}}{2}$
4π	0



to plot in Desmos: plot as the
parametric curve

$$\left(\sin\left(\frac{t}{2}\right) \cos t, \sin\left(\frac{t}{2}\right) \sin t \right)$$

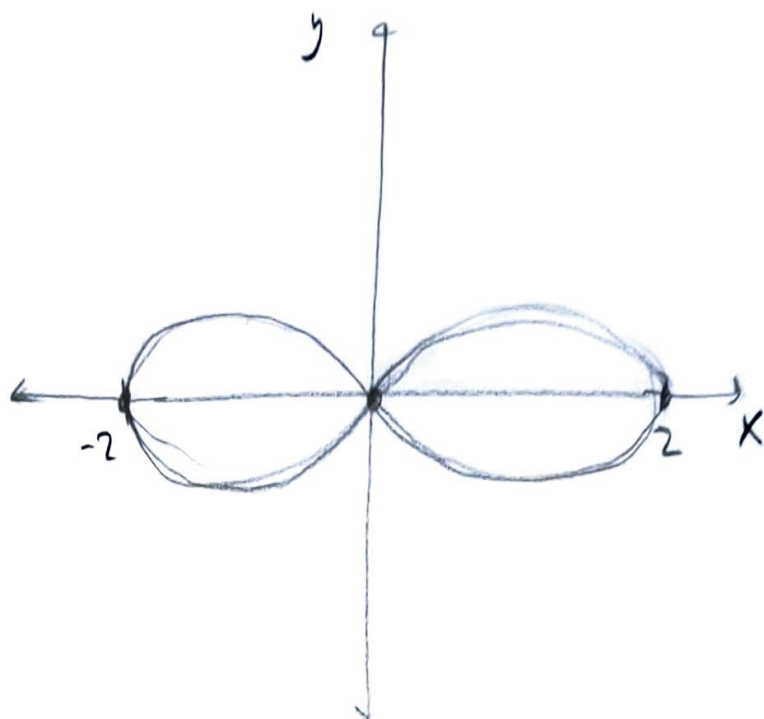
$$0 \leq t \leq 4\pi$$

Or, easier, just type $r = \sin(\theta/2)$

$$1 + \cos 2\theta$$

Axis intercepts

θ	$r = 1 + \cos 2\theta$
0	2
$\frac{\pi}{2}$	0
π	2
$\frac{3\pi}{2}$	0
2π	2



Plot in Desmos as the parametric
curve $((1 + \cos 2t) \cos t, (1 + \cos 2t) \sin t)$

$$0 \leq t \leq 2\pi$$

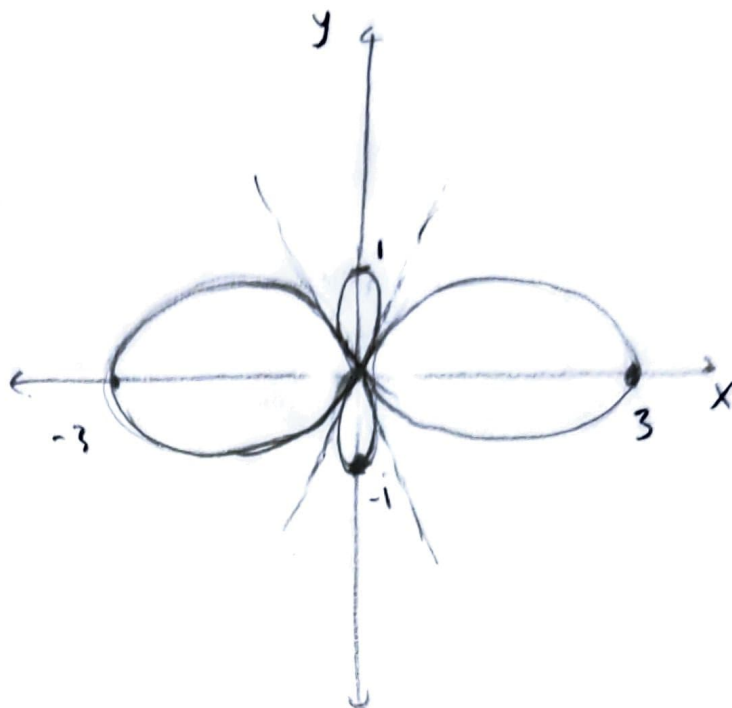
Or as $r = 1 + \cos(2\theta)$

Graph 5

$$r = 1 + 2\cos 2\theta$$

Axis intercepts

θ	$r = 1 + 2\cos 2\theta$
0	3
$\frac{\pi}{2}$	-1
π	3
$\frac{3\pi}{2}$	-1
2π	3



$$0 = 1 + 2\cos 2\theta \Rightarrow \cos 2\theta = -\frac{1}{2}$$

$$\Rightarrow 2\theta = \frac{2\pi}{3} \text{ or } \frac{4\pi}{3} \text{ or } \dots$$

$$\theta = \frac{\pi}{3} \text{ or } \frac{2\pi}{3} \text{ or } \frac{4\pi}{3} \text{ or } \frac{5\pi}{3} \text{ or } \dots$$

Plot in Desmos as the parametric curve

$$((1 + 2\cos 2t)\cos t, (1 + 2\cos 2t)\sin t)$$

$$0 \leq t \leq 2\pi$$

or as $r = 1 + 2\cos(2\theta)$