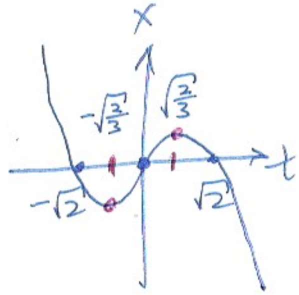
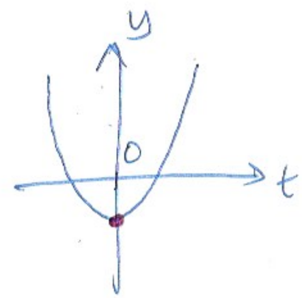
RECONSIDER $x = 2t - t^3 = t(2-t^2)$ $\qquad x'(t) = 2 - 3t^2 = 0$

$y = t^2 - 1$ $\qquad t = \pm\sqrt{\frac{2}{3}}$

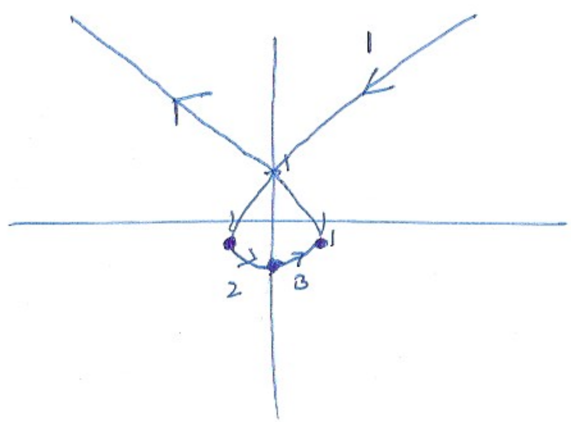




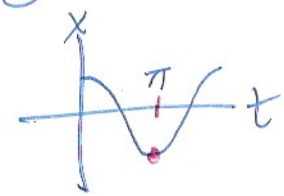
		$-\sqrt{\frac{2}{3}}$		0		$\sqrt{\frac{2}{3}}$		t
	↙		↘		↗		↖	
X	DECR ←		INCR →		INCR →		DECR ←	
y	DECR ↓		DECR ↓		INCR ↑		INCR ↑	
		$\left(-\frac{4}{3}\sqrt{\frac{2}{3}}, -\frac{1}{3}\right)$		$(0,-1)$		$\left(\frac{4}{3}\sqrt{\frac{2}{3}}, -\frac{1}{3}\right)$		

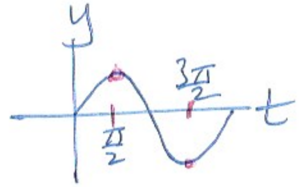
$\sqrt{\frac{2}{3}}\left(2 - \frac{2}{3}\right)$

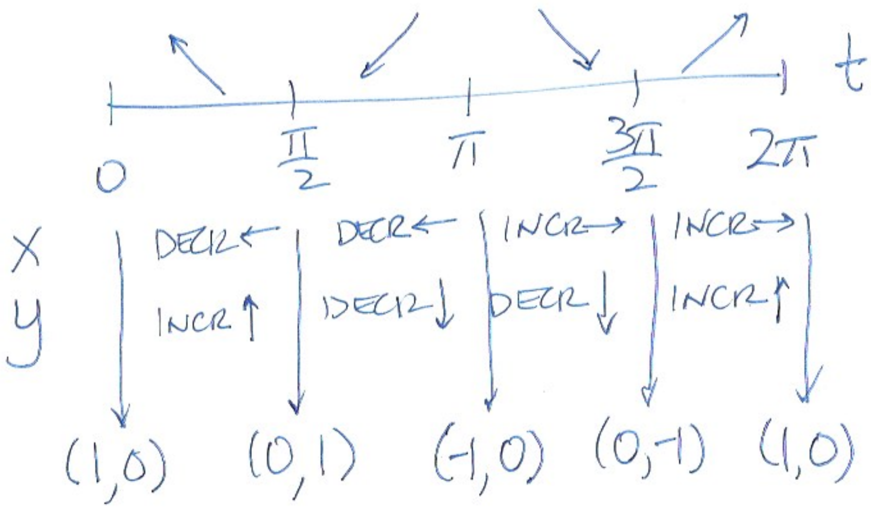
$\frac{4}{3}\sqrt{\frac{2}{3}}$



CONSIDER $x=\cos t$
$y=\sin t$ $\quad t\in[0,2\pi]$

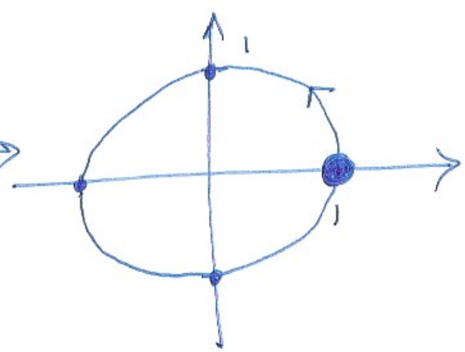






$\cos^2 t+\sin^2 t=1$

$x^2+y^2=1$



ELIMINATING THE PARAMETER

$t=\cos^{-1}x$

$y=\sin(\underbrace{\cos^{-1}x})$

$t=\cos^{-1}x\in[0,\pi]$

$t\in Q_1, Q_2$

$y=\sin t\geq 0\rightarrow Q_1, Q_2$

☆ NEVER USE INVERSE TRIG NOR HYP FOR ELIMINATING THE PARAMETER —

USE IDENTITIES INSTEAD

$x = \cos t$
$y = \sin t$ $\quad t \in [0, 2\pi] \longrightarrow$ CIRCLE CENTER $(0,0)$ RADIUS 1

START @ $(1,0)$ COUNTERCLOCKWISE

$(x^2 + y^2 = 1)$

RIGHTMOST POINT

CIRCLE CENTER (h,k) RADIUS r

$$(x-h)^2 + (y-k)^2 = r^2$$

$$\frac{(x-h)^2}{r^2} + \frac{(y-k)^2}{r^2} = 1$$

$$\left(\frac{x-h}{r}\right)^2 + \left(\frac{y-k}{r}\right)^2 = 1 \qquad \cos^2 t + \sin^2 t = 1$$

$$\frac{x-h}{r} = \cos t, \quad \frac{y-k}{r} = \sin t$$

$$\boxed{\begin{aligned} x &= h + r\cos t \\ y &= k + r\sin t \end{aligned}}$$

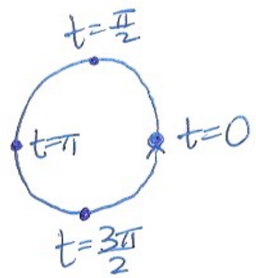
eg. CIRCLE CENTER $(-1, 2)$ RADIUS 4

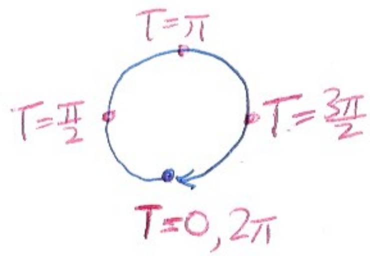
$$x = -1 + 4\cos t$$
$$y = 2 + 4\sin t \qquad t \in [0, 2\pi]$$

UNIT CIRCLE

START@BOTTOM, CLOCKWISE

$x = \cos t$
$y = \sin t$





$x = \cos\left(\frac{3\pi}{2} - T\right)$
$y = \sin\left(\frac{3\pi}{2} - T\right)$

$t = \frac{3\pi}{2} \quad \pi \quad \frac{\pi}{2} \quad 0$

$T = 0 \quad \frac{\pi}{2} \quad \pi \quad \frac{3\pi}{2}$

$t = mT + b$
$t = -T + b$
$t = \frac{3\pi}{2} - T$

$$m = \frac{\Delta t}{\Delta T} = \frac{\pi - \frac{3\pi}{2}}{\frac{\pi}{2} - 0} = \frac{-\frac{\pi}{2}}{\frac{\pi}{2}} = -1$$

$b =$ VALUE OF t WHEN $T = 0$
$= \frac{3\pi}{2}$