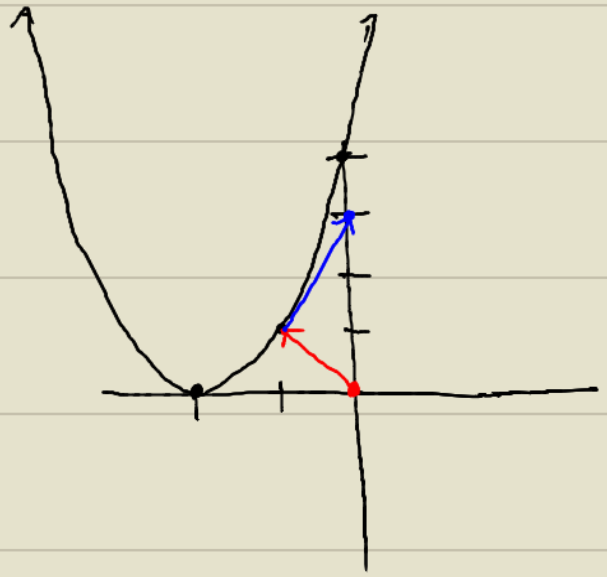
1. $\vec{r}(t) = (t-2)\vec{i} + t^2\vec{j}$, $t_0 = 1$

$\vec{r}\,'(t) = \vec{i} + 2t\vec{j}$

- $\vec{r}(t_0) = \vec{r}(1) = (1-2)\vec{i} + 1^2\vec{j}$
  $= -\vec{i} + \vec{j}$
- $\vec{r}\,'(t_0) = \vec{r}\,'(1) = \vec{i} + 2(1)\vec{j}$
  $= \vec{i} + 2\vec{j}$



$x = t-2 \qquad y = t^2$

$x+2 = t$

Now plug this in

$y = t^2$

$y = (x+2)^2$

2. $\vec{r}(t) = \langle 2\sin(t), 3\cos(t)\rangle \qquad t_0 = \frac{\pi}{2}$

$2\sin(t)\vec{i} + 3\cos(t)\vec{j}$

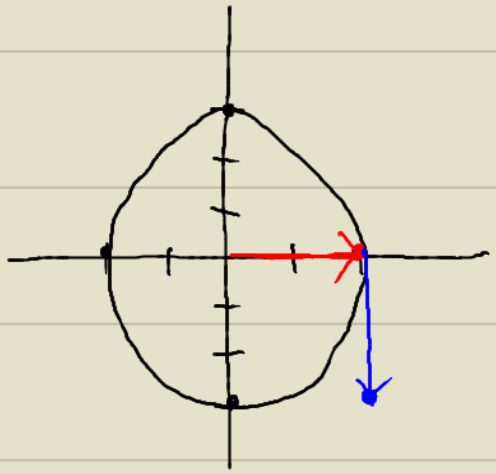
$\vec{r}\,'(t) = \langle 2\cos t, -3\sin t\rangle$

$\vec{r}(t_0) = \langle 2\sin\frac{\pi}{2}, 3\cos\frac{\pi}{2}\rangle$

$= \langle 2, 0\rangle$

$\vec{r}\,'(t_0) = \langle 2\cos\frac{\pi}{2}, -3\sin\frac{\pi}{2}\rangle$

$= \langle 0, -3\rangle$



$x = 2\sin t \qquad y = 3\cos t$

$\frac{x}{2} = \sin t \qquad \frac{y}{3} = \cos t$

$\left(\frac{x}{2}\right)^2 = \sin^2 t \qquad \left(\frac{y}{3}\right)^2 = \cos^2 t$

$\frac{x^2}{4} = \sin^2 t \qquad \frac{y^2}{9} = \cos^2 t$

$\frac{x^2}{4} + \frac{y^2}{9} = \sin^2 t + \cos^2 t$

$\frac{x^2}{4} + \frac{y^2}{9} = 1$