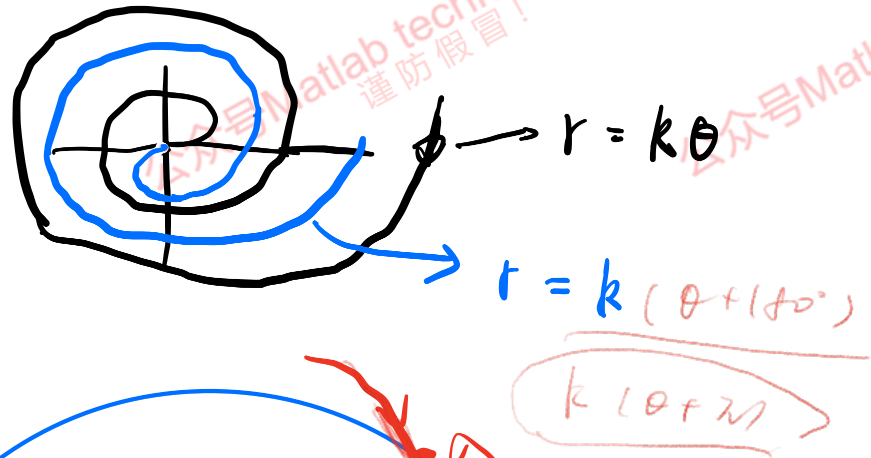
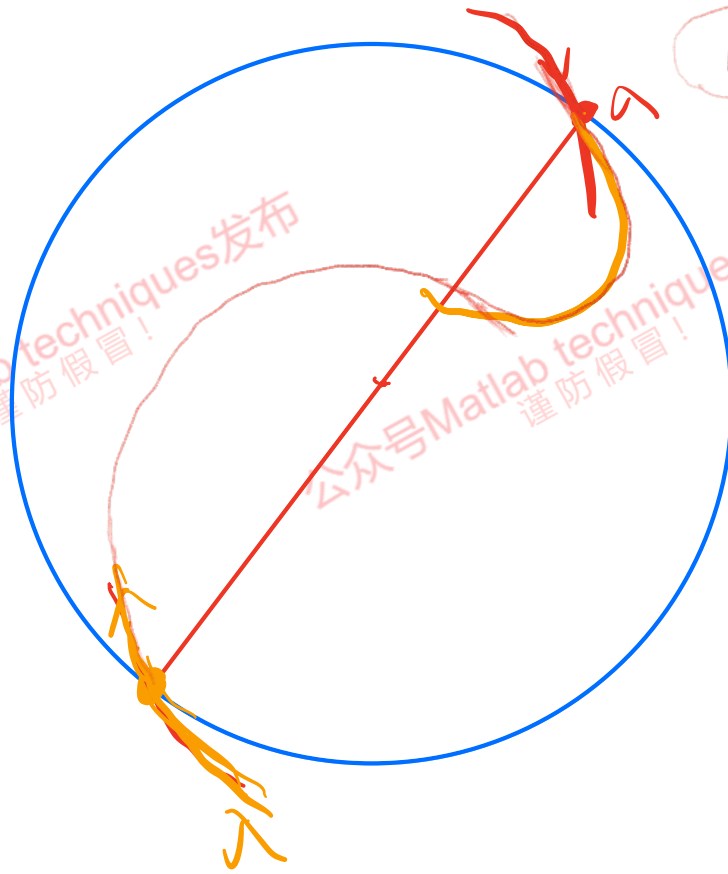
中心对称.





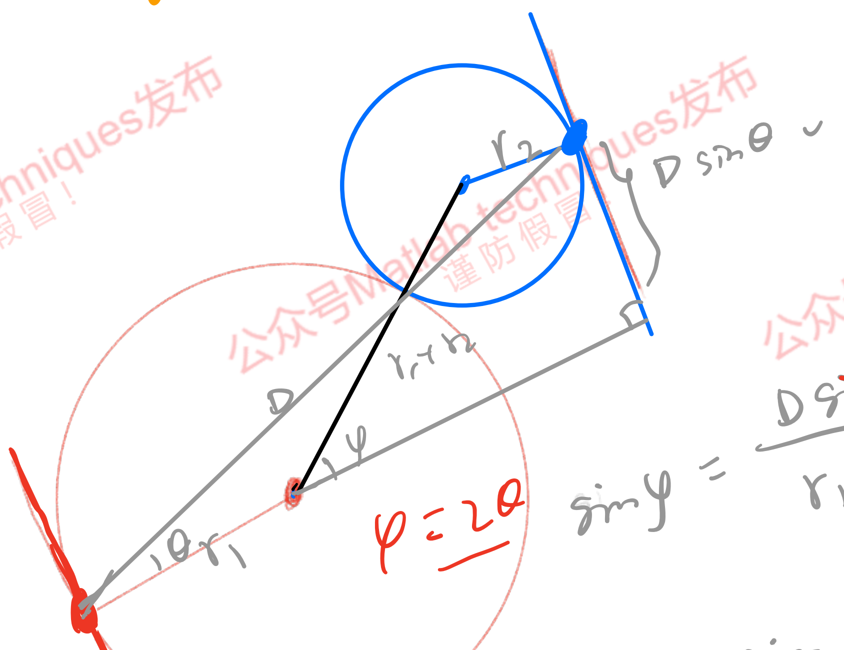
$r = k\theta$

$x = r\cos\theta$

$y = r\sin\theta$

$$\frac{dy}{dx} = \frac{\frac{dy}{d\theta}}{\frac{dx}{d\theta}} = \frac{k\sin\theta + r\cos\theta}{k\cos\theta - r\sin\theta}$$

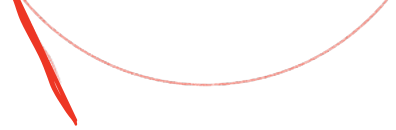
入点，切线



$\varphi = 2\theta$

$$\sin\varphi = \frac{D\sin\theta}{r_1 + r_2}$$

$$\frac{D\sin\theta}{\ldots}$$



$\varphi \neq \arcsin \frac{\quad}{r_1+r_2}$

$r_1+r_2+(r_1+r_2)\cos\varphi = D\cos\theta$

$S = r_1(\pi-\varphi)+r_2(\pi-\varphi)$

$= (r_1+r_2)\pi-(r_1+r_2)\varphi$.

$t + t\cos\varphi = D\cos\theta$

$t\sin\varphi = D\sin\theta$

$(r_1+r_2)\pi-(r_1+r_2)\arcsin\frac{D\sin\theta}{r_1+r_2}$

$\cancel{t^2} = (D\cos\theta - t)^2 + D^2\sin^2\theta$

$S = t\pi - t\arcsin\frac{D\sin\theta}{t}$

t 是定值!!

$\Leftrightarrow D^2 + \cancel{t^2} - 2tD\cos\theta$

$t\cos\theta = \frac{D}{2}$

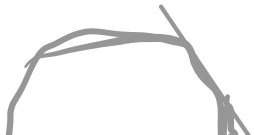
代数法，几何法.

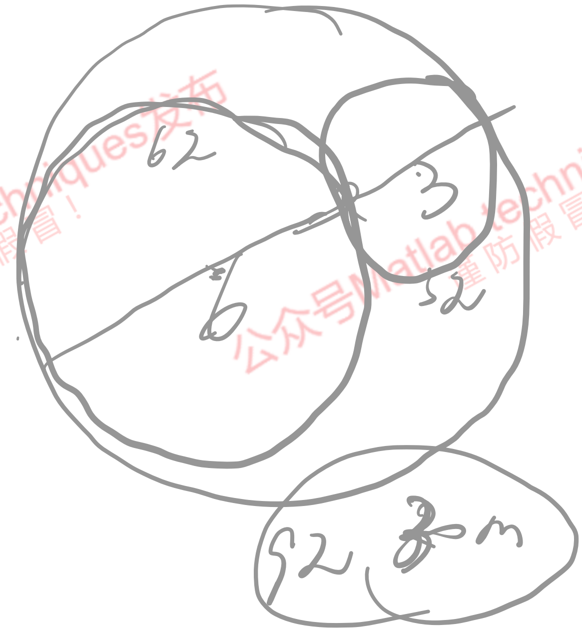
$t\cos\theta = \frac{D}{2}$ $t \sim \frac{D}{2\cos\theta}$ ✓

$r_1 + r_2 = 3r_2$ ✓

$r_1 = 2r_2$ ✓

大齿轮运动:



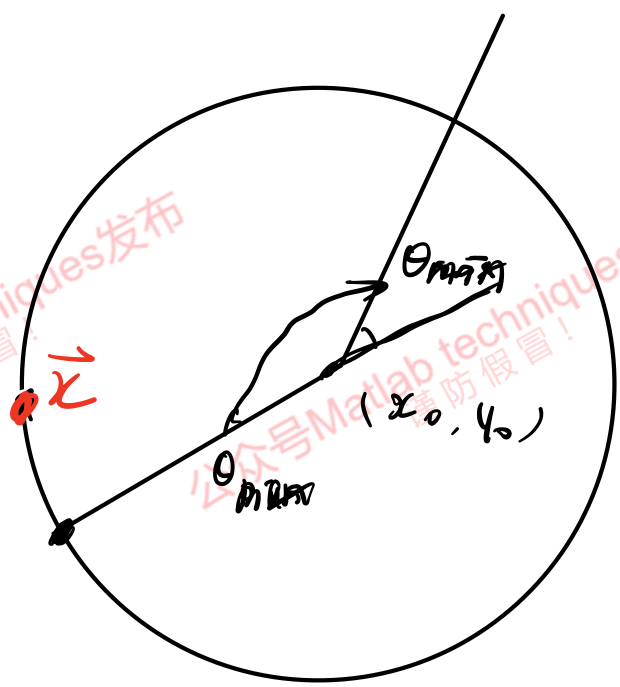


① 传 看后把手 依次在 出界时求

所以会奇怪!!

~~$k\theta_1$~~

$$(k\theta_1\cos\theta_1 - x_0)^2 + (k\theta_1\sin\theta_1 + y_0)^2 = P_1^2$$



① ✓

$x = r_1\cos\theta + x_0$

$y = r_1\sin\theta + y_0$

$$ds = \sqrt{x'^2 + y'^2}\, d\theta$$

$$= \sqrt{r_1 \sin^2 + r_1 \cos^2}\, d\theta = \underline{r\, d\theta}$$

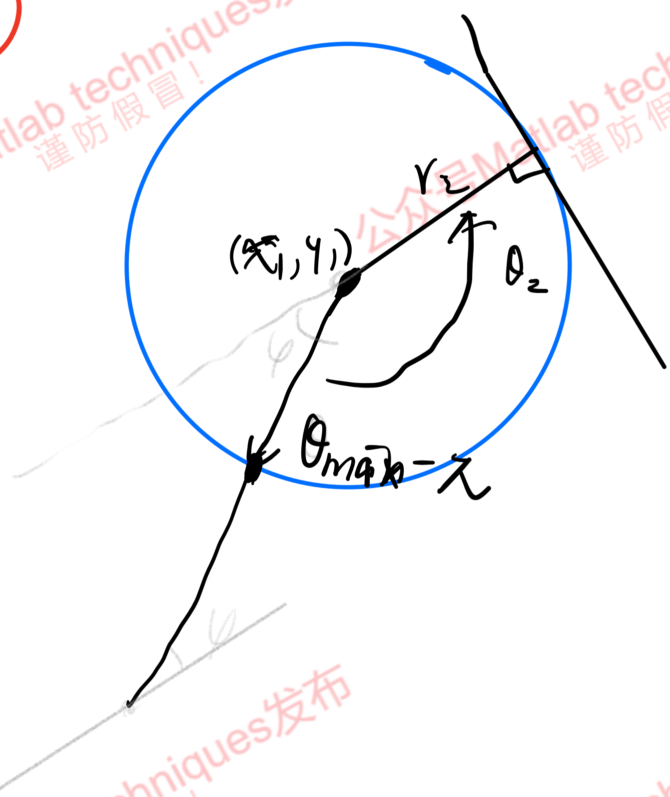
$$\frac{ds}{dt} = 2 \iff r\frac{d\theta}{dt} = 2$$

$$\frac{d\theta}{dt} = \frac{2}{r}$$

$$\theta = \frac{2t}{r} + k$$

$\theta_0 = \theta_{max}$ ✓ ↓ θ_{min} ✓

②



$$\theta = \frac{t}{r_2} + c$$

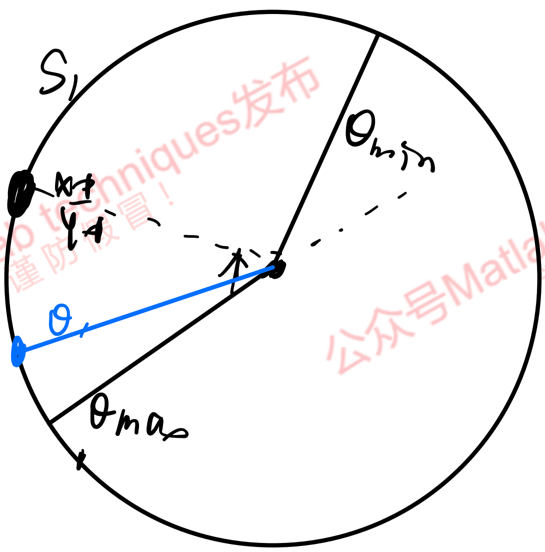
$\theta(0) \sim \theta_{max} - 2$.

$$\theta \sim \frac{t}{r_2} + \underline{\theta_{max} - 2}$$

<u>分四段</u>

① θ -10 ~ 0s. 在入 直接求 v.

② $0s \sim S_1 \sim t$, $S_1 \sim r_1 \cdot \Delta\theta$

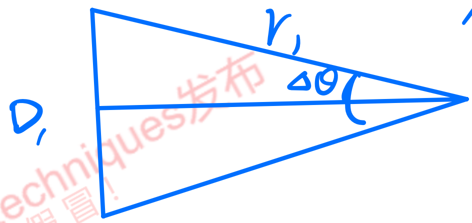


先求 x_1, y_1 相对 (x_0, y_0) 角度.

$\theta_{max} - \Delta\theta = \theta_{max} - \frac{S_1}{r_1}$ 为止.

求 θ_1 使 $\theta_{max} - \frac{S_1}{r_1} \le \theta_1 \le \theta_{max}$.

$\frac{\Delta\theta}{2} = \arcsin\frac{D_1/2}{r_1} \sim \Delta\theta$ ✓ ,



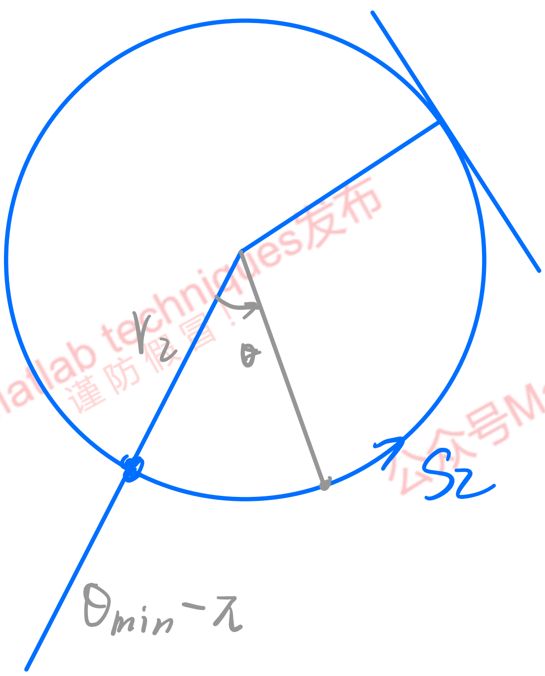
若 $\Delta\theta > \frac{S_1}{r_1}$, 重新在生成求.

若 $\Delta\theta \le \frac{S_1}{r_1}$, ✓

求下一个点.

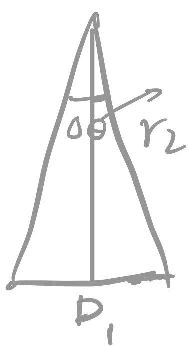
可以用个循环

①



$S_1 < t \le S_1 + S_2$

$$\theta = \frac{t - S_1}{r_2} + \theta_{min} - \pi$$



$\frac{\Delta\theta}{2} = \arcsin\frac{D_1/2}{r_2}$

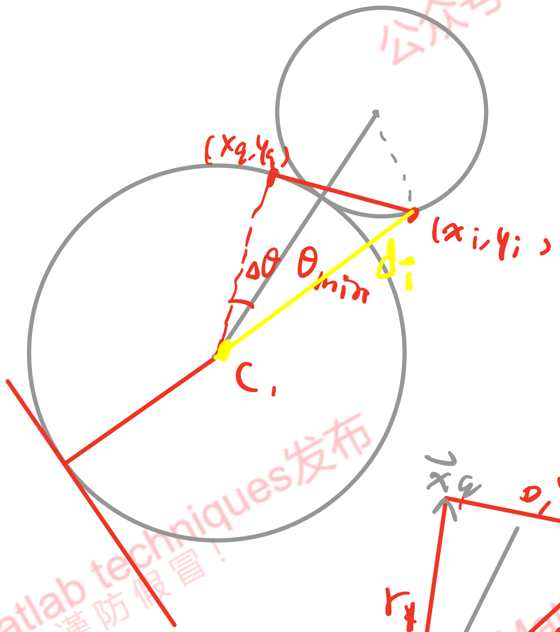
$\Delta\theta \sim 2\arcsin\frac{D_1/2}{r_2}$.

若 $\Delta\theta < \frac{t-s_1}{r_2}$，在圆2上。

角坐标 θ_i：$\theta-\Delta\theta$，

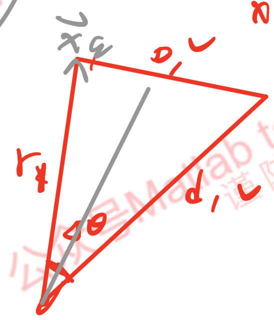
$r_2\cos(\theta_i)$、$r_2\sin(\theta_i)$ ✓

若 $\Delta\theta \geq \frac{t-s_1}{r_2}$ 在圆1内。



(x_q,y_q) 相对于 C_1 为 $\theta_{min}-\Delta\theta$

$x_q = r_1$



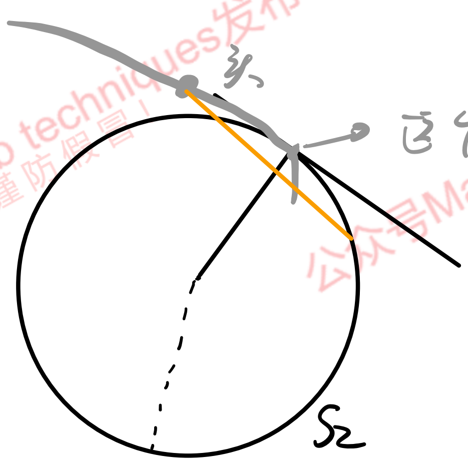
解三角形，求 $\Delta\theta$ ✓

则 求到圆心角 ✓

也在 圆 C_1 上 ✓。

下一个用 C_1 段判断!!

④ $t > S_1 + S_2$ ✓



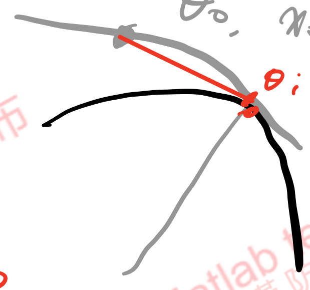
螺：$r = k(\theta+\lambda)$

$ds = \sqrt{r^2 + r'^2}\, d\theta$

$= \sqrt{k^2(\theta+\lambda)^2 + k^2}\, d\theta$

$= k\sqrt{(\theta+\lambda)^2 + 1}\, d\theta$

2中已知 θ_0, x_0, y_0 ✓



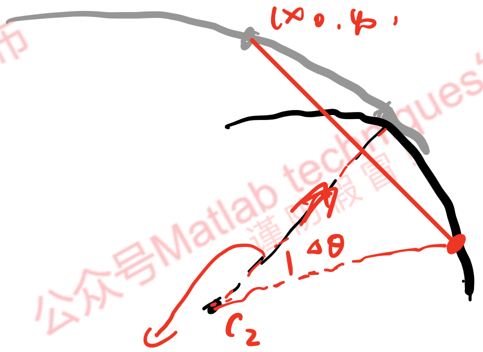
求 θ_1 ($\theta_1 < \theta_0$)

距同一直线距离

$f(\theta_1) - D_1^2 = 0$. 求 θ_1

若 $\theta_1 > \theta_i$ → 在 4 线上 ✓

若 $\theta_1 < \theta_i$ → 在 C_2 圆上、



→ $r_2 \cos(\theta_2^m - \Delta\theta)$

$r_2 \sin(\quad)$

$\theta_2^m = \theta_{min} - \lambda * \frac{S_2}{r_2}$ 角.

建立: $f(\Delta\theta) - D_1^2 = 0$.

只有一个解! $\Delta\theta > 0$.

而后, 圆上一直在迭代.

五：再打多圈

$$\frac{\sqrt{\Delta x^2+\Delta y^2}}{\Delta t}$$ 求速度！