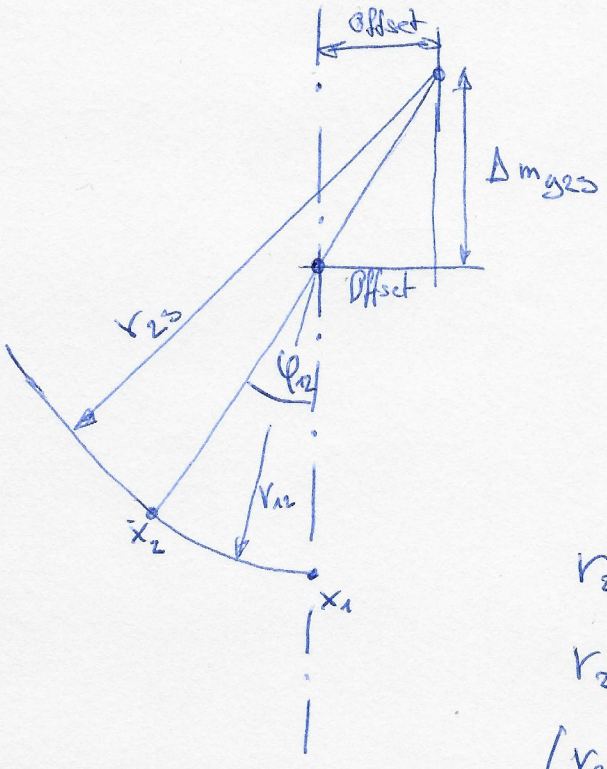
Überlegungen Timing Gear



$$\frac{offset}{\sin(\varphi_{12})} = \frac{\Delta m_{g23}}{\cos(\varphi_{12})}$$

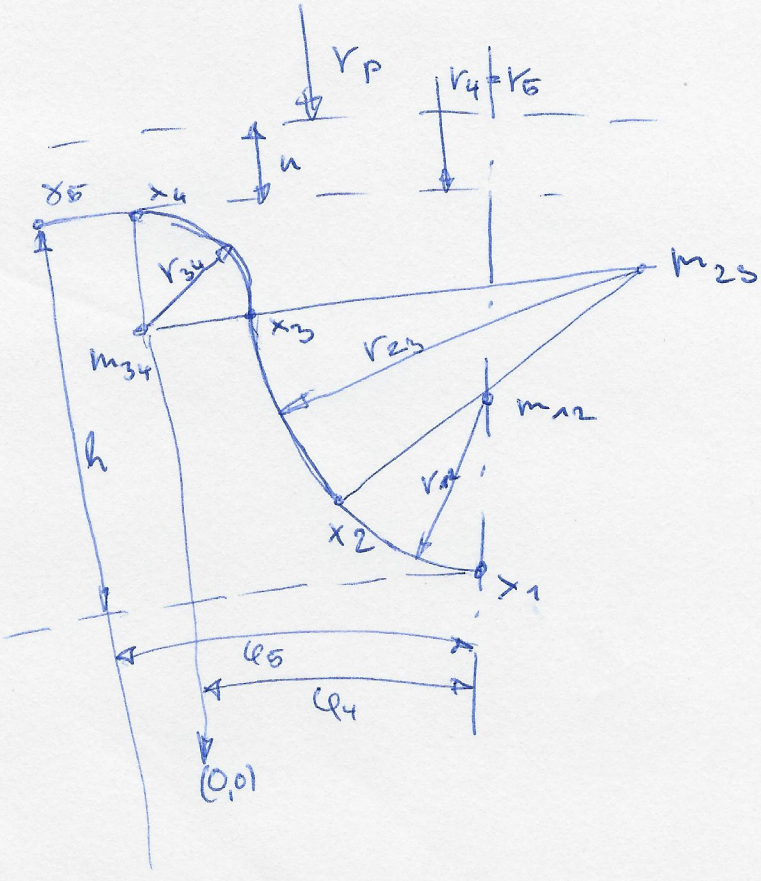
$$\frac{offset}{\tan(\varphi_{12})} = \Delta m_{g23}$$

$$r_{23} = r_{12} + \sqrt{offset^2 + \Delta m_{g23}^2}$$

$$r_{23} - r_{12} = offset \cdot \sqrt{1 + \frac{1}{\tan(\varphi_{12})^2}}$$

$$\left(\frac{r_{23} - r_{12}}{offset}\right)^2 - 1 = \frac{1}{\tan(\varphi_{12})^2}$$

$$\boxed{\arctan\left(\sqrt{\frac{1}{\left(\frac{r_{23} - r_{12}}{offset}\right)^2 - 1}}\right) = \varphi_{12}}$$



$$\varphi_4 : \left[(r_5 - r_{34}) \cdot \sin(\varphi_4) + offset\right]^2 + \left[(r_5 - r_{34}) \cdot \cos(\varphi_4) - m_{g23}\right]^2 = \left(r_{34} + r_{23}\right)^2$$

Algebraische Lösung mittels sympy

$\varphi_4 = \ldots$