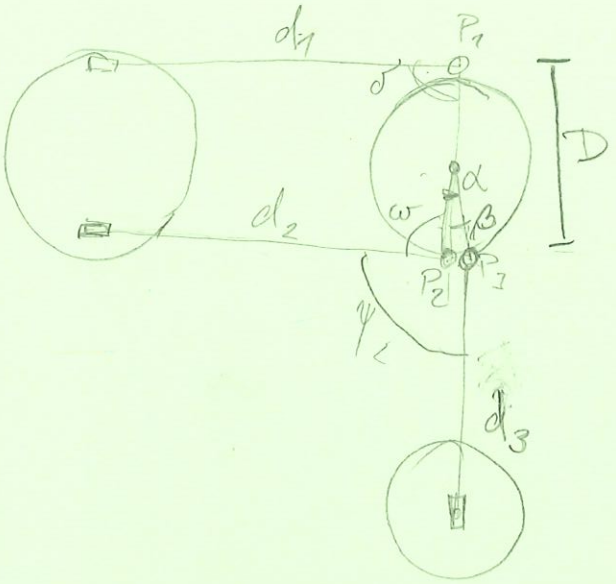
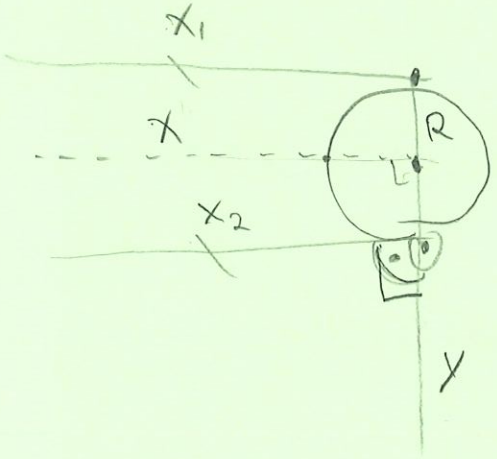


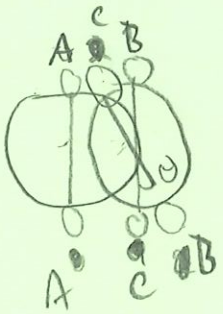
c

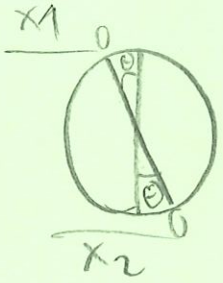


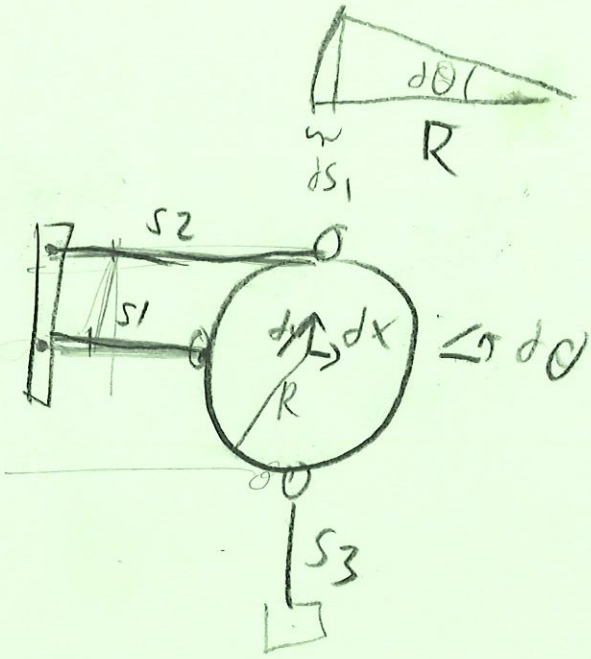
$$\Delta X = \frac{\Delta X_1 + \Delta X_2}{2}$$

$$\frac{D}{2}\theta = \frac{\Delta X_2 - \Delta X_1}{2}$$

- counterclockwise







$ds_1 = R(1-\cos d\theta) + dx$

$$ds_1 = dx + R(1-\cos d\theta) \simeq dx + \frac{R d\theta^2}{2}$$

$$ds_3 = dy + R(1-\cos d\theta) \simeq dy + \frac{R d\theta^2}{2}$$

$$ds_2 = dx + R\sin d\theta \simeq dx + R d\theta$$

Imperfections: S_1 or S_3 SMR off center: translations.

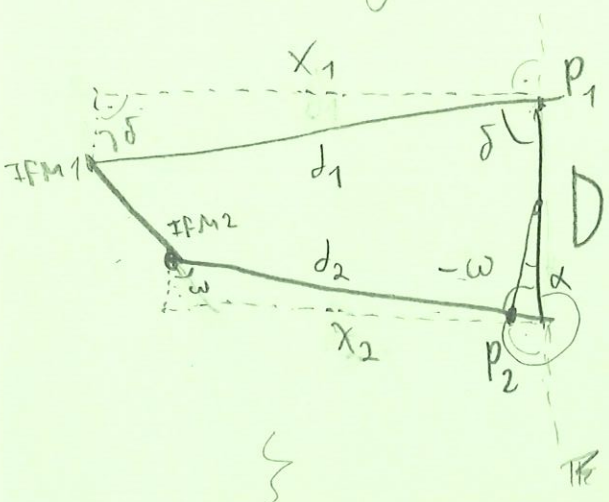
B • S_1 & S_3 not $\perp$

C • S_1 & S_2 not $\parallel$

D • not planar

E • S_1 & S_2 planar angles.

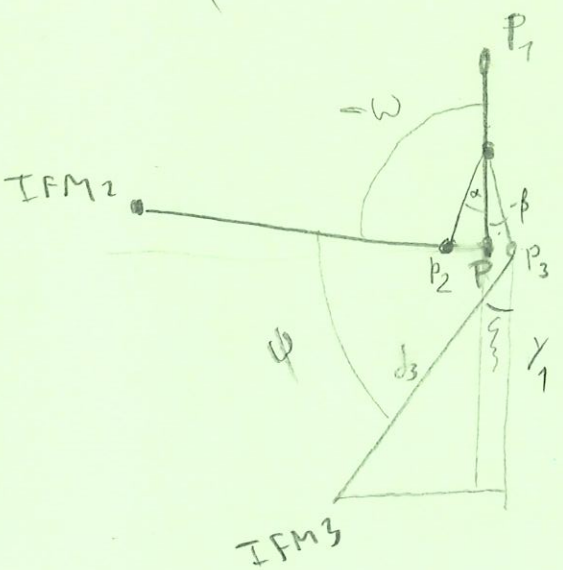
Positive angles - counterclockwise!



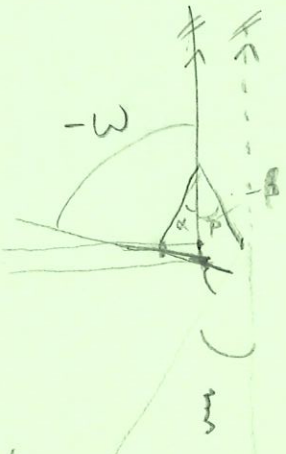
~~$d_1 \cos\delta = X_1$~~

~~d_2~~

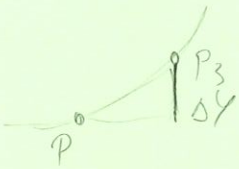
$$d_1 \sin\delta = X_1$$
$$d_2 \sin(4R-\omega) + \tfrac{1}{2} D \sin\alpha = X_2$$



$$(-\omega) + \psi + \xi = 2R$$
$$\xi = 2R - \psi - (-\omega)$$
$$Y_1 = d_3 \sin\xi$$

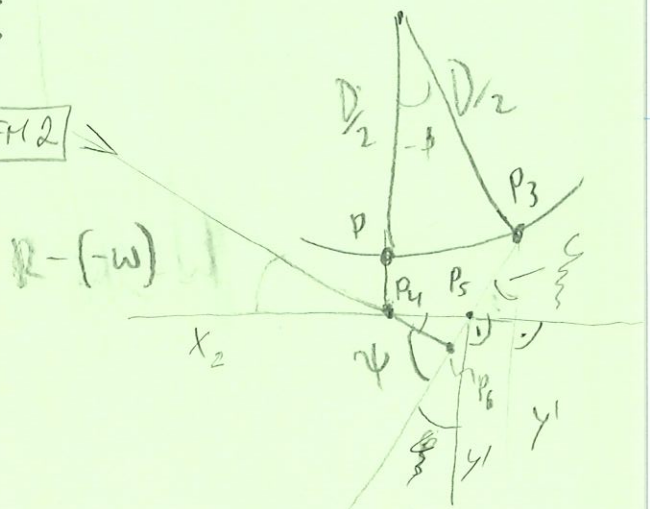


$$y = Y_1 + \left(\frac{D}{2} - \frac{D}{2}\cos\beta\right)$$

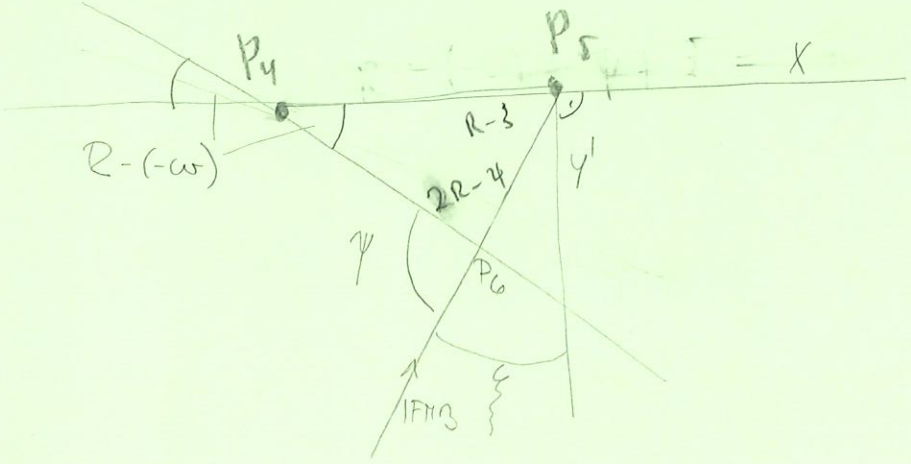


$$2R = R - (-\omega) + R - \xi + 2R - \psi$$
$$2R = 4R - (-\omega + \xi + \psi)$$
$$2R = -\omega + \xi + \psi$$

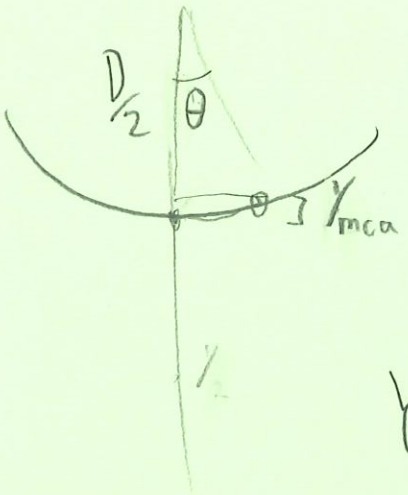
IFM 2



IFM 3



Rotation correction to Y



$$Y_{mca} = \frac{D}{2} - \frac{D}{2}\cos\Theta \quad \text{Small!}$$

$$Y = y - Y_{mca}$$

$$Y = d_3 \sin\xi - \left(\frac{D}{2} - \frac{D}{2}\cos\Theta\right) + \underbrace{\left(\frac{D}{2} - \frac{D}{2}\cos\beta\right)}_{\text{irrelevant Constant}}$$

$$\Theta = \frac{2}{D}\,\frac{\Delta X_2 - \Delta X_1}{2}$$

$$\Delta X = \frac{\Delta X_1 + \Delta X_2}{2}$$

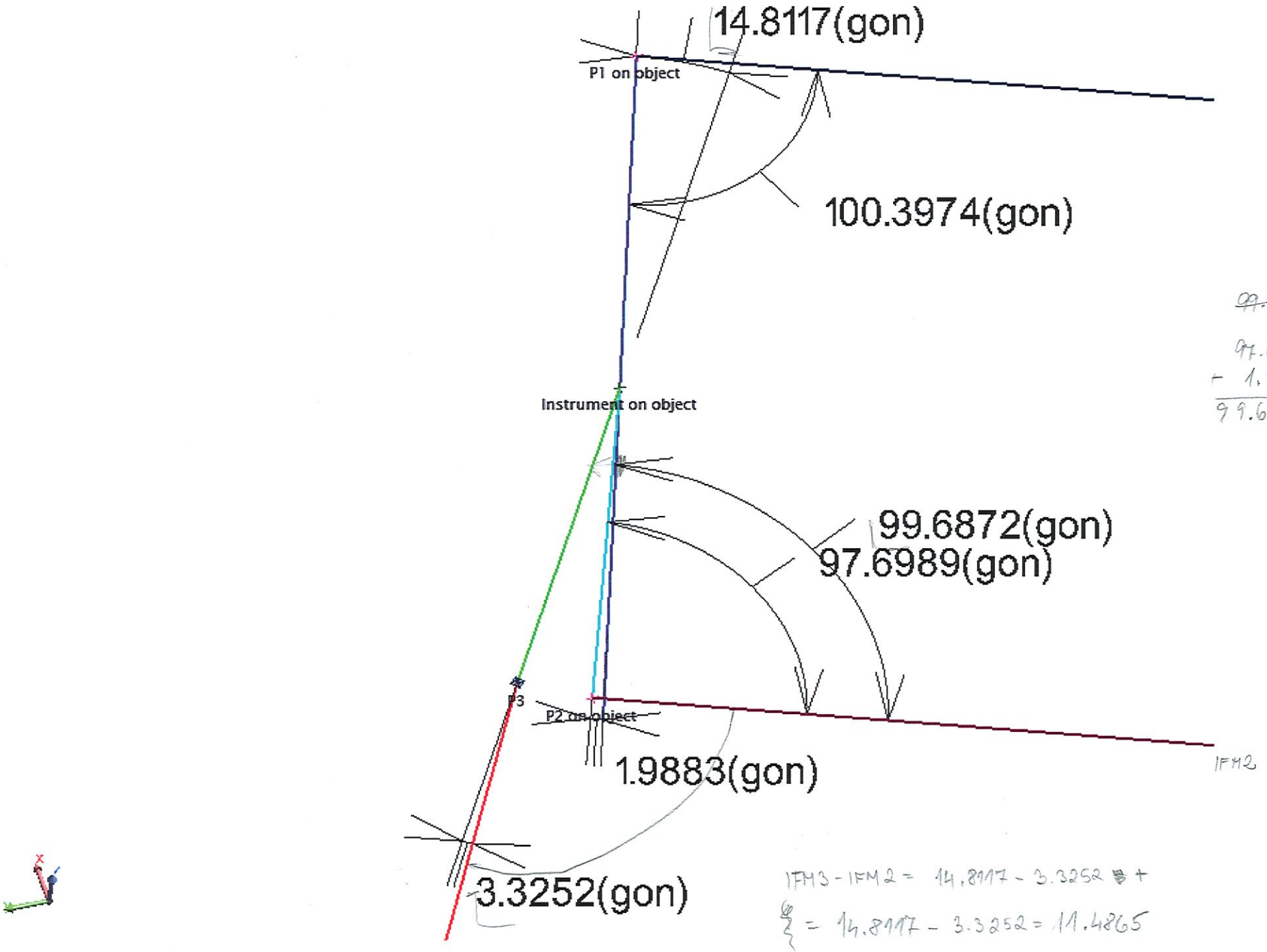
$$\Delta X_1 = \Delta d_1 \sin\delta$$

$$\Delta X_2 = \Delta d_2 \sin(4R - W)$$

$$\xi = 2R - \Psi - (-\omega)$$

$$\Delta Y = \Delta d_3 \sin\xi - \underbrace{\left(\frac{D}{2} - \frac{D}{2}\cos\Theta\right)}_{\text{Small}}$$

Complete Solution to the 2D Plane.



~~99.6~~

97.6989
+ 1.9883
99.6872

IFM3 - IFM2 = 14.8117 - 3.3252 ⊕ +

⊖ = 14.8117 - 3.3252 = 11.4865

$$\Delta X = \frac{\left(d_{1i} \cdot \sin\gamma - d_{1i-1} \cdot \sin\gamma\right) + \left(d_{2i} \cdot \sin(4\rho - \omega) - d_{2i-1} \cdot \sin(4\rho - \omega)\right)}{2}$$

$$= \frac{\left((d_{1i} - d_{1i-1}) \cdot \sin\gamma\right) + \left((d_{2i} - d_{2i-1}) \cdot \sin(4\rho - \omega)\right)}{2}$$

$$\Delta Y = \sin\{ \cdot (d_{3i} - d_{3i-1}) - \left(\frac{D}{2} - \frac{D}{2} \cdot \cos\theta\right)$$

$$\theta = \frac{\left((d_{2i} - d_{2i-1}) \cdot \sin(4\rho - \omega)\right) - \left((d_{1i} - d_{1i-1}) \cdot \sin\gamma\right)}{D}$$

d_1, d_2, d_3 are horizontal distances

$D = 173.588$

$\gamma = 100.3974$ gon (1577.0390 mRad)

$\alpha = -1.9883$ gon (31.2322 mRad)

$-\beta = 14.8117$ gon (232.6618 mRad)

$-\omega = 99.6872$ gon

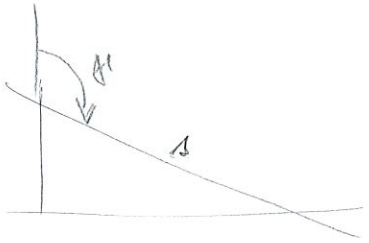
$\psi = 114.4989$ gon

$\{ = -11.4865$ gon (−180.4295 mRad)

1) $d_2 = -0.044745$ $\quad \vartheta_1 = 102.8495$ gon

2) $d_2 = -0.041831$ $\quad \vartheta_2 = 102.6638$ gon

3) $d_2 = -0.056736$ $\quad \vartheta_3 = 103.6139$ gon



$d = S \cdot \cos(\vartheta)$