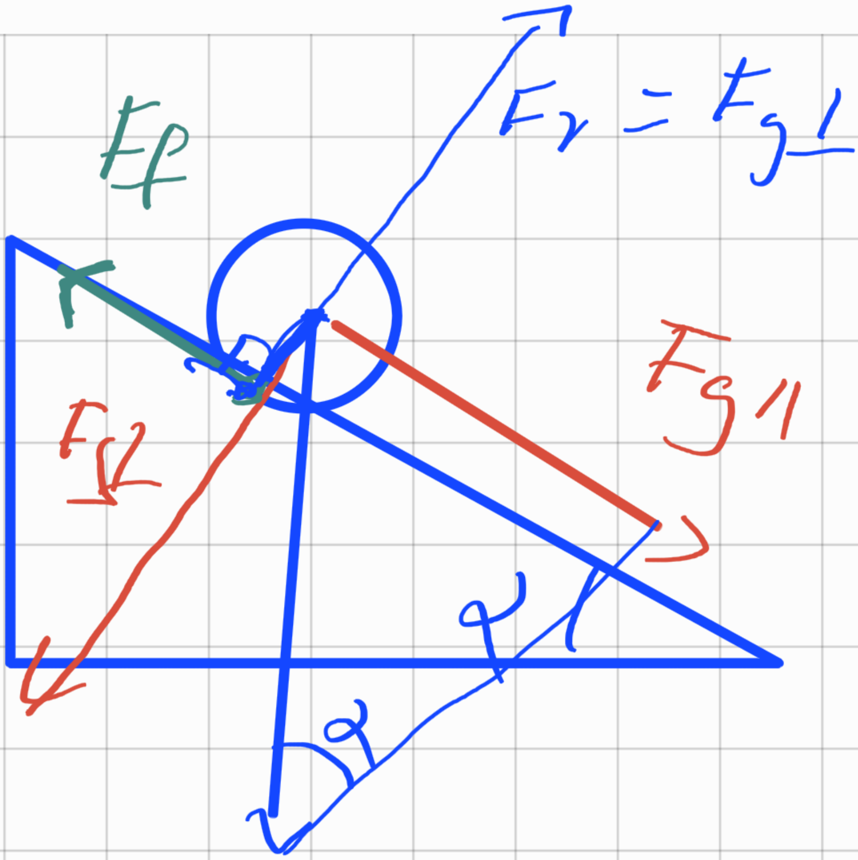
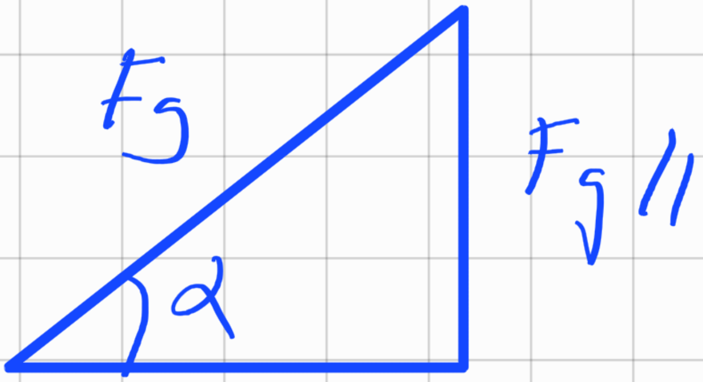
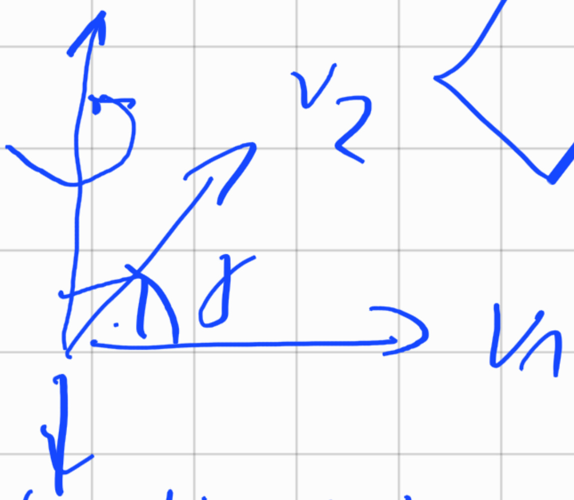




$$F_{g\parallel} = F_g \cdot \sin(\alpha)$$

$$T = r \times F$$

Nm



$$V_1 \times V_2 \neq V_2 \times V_1$$

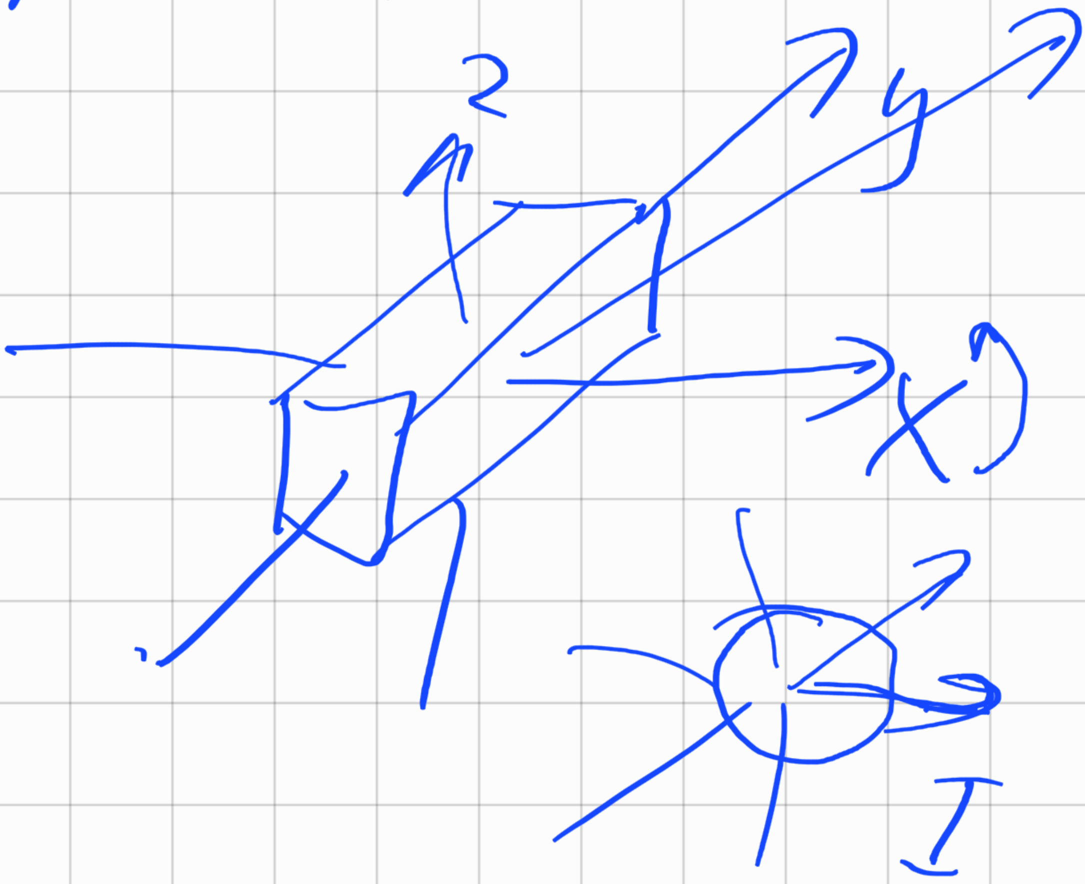
$$T = rF \cdot \sin(\gamma)$$

$$F = F_g \sin(\alpha) - F_f$$

m-ant

$$F = ma$$

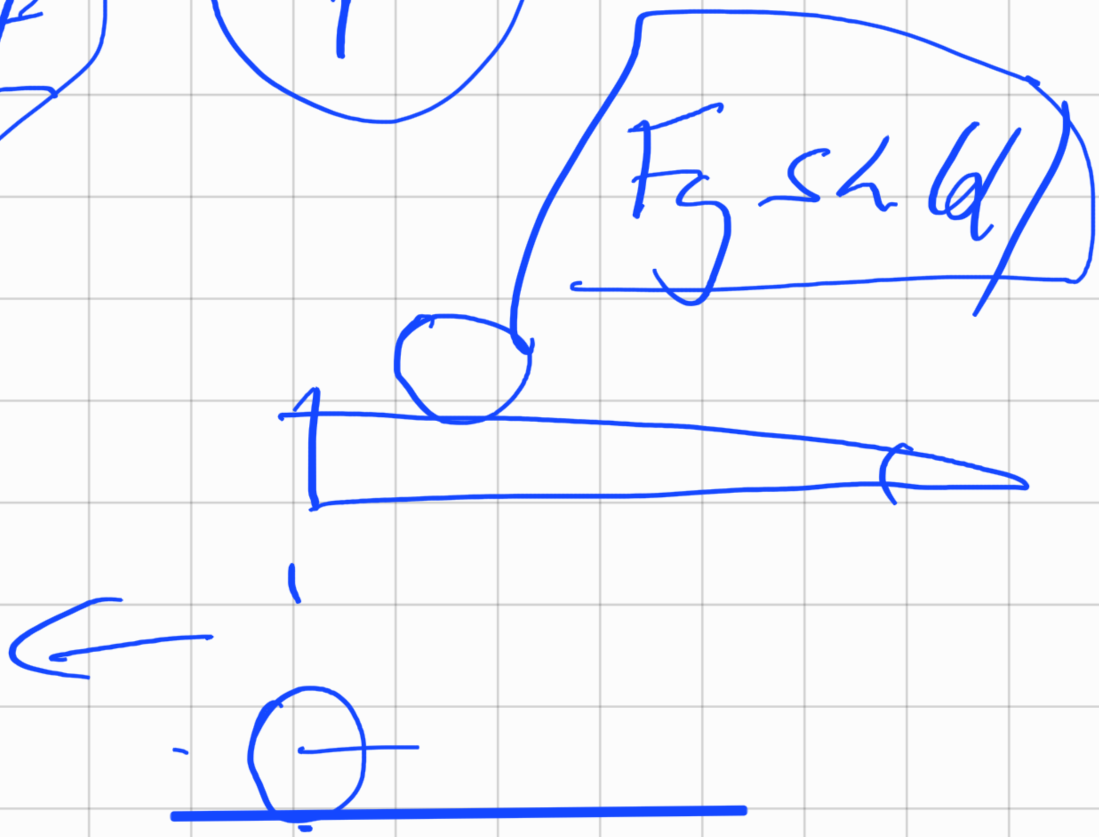
$$T = I \varepsilon$$



$$r \cdot F_f \sin(50^\circ) = r \cdot F_f$$

$$r F_f = T = I \varepsilon$$

$$F_f = \frac{I\varepsilon}{r}$$



$$F = F_{g\parallel} - F_f$$

$$F_g = mg$$

$$F = mg\sin(\alpha) - \frac{I\varepsilon}{r}$$

$$F = ma$$

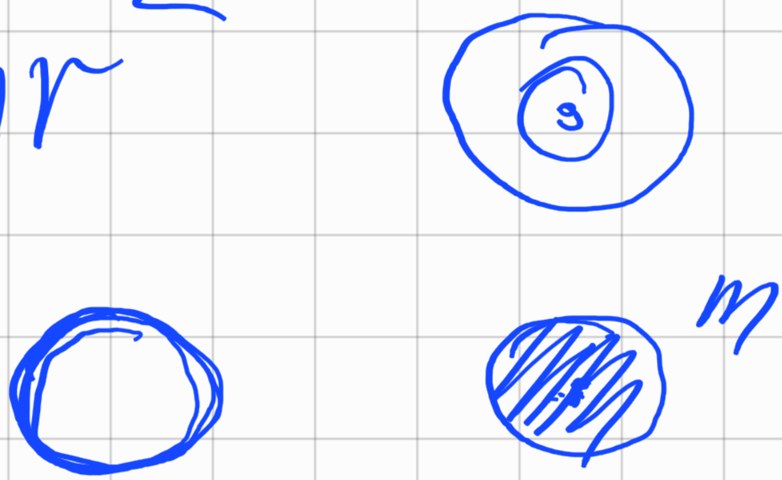
$$ma = mg\sin(\alpha) - \frac{I\varepsilon}{r}$$

$$\varepsilon = \frac{a}{r}$$

$$ma = mg\sin(\alpha) - \frac{Ia}{r^2}$$

$$ma + \frac{Ia}{r^2} = mg\sin(\alpha)$$

$$I = q\, mr^2$$



$$I_B = \frac{2}{5} m r^2$$

$$I_s = \frac{2}{3} m r^2$$

$$ma - \frac{Ia}{r^2} = mg \sin(\alpha)$$

$$\cancel{m} a\left(1 - \frac{I}{mr^2}\right) = \cancel{m} g \sin(\alpha)$$

$$a = \frac{g \sin(\alpha)}{1 + \frac{I}{mr^2}}$$

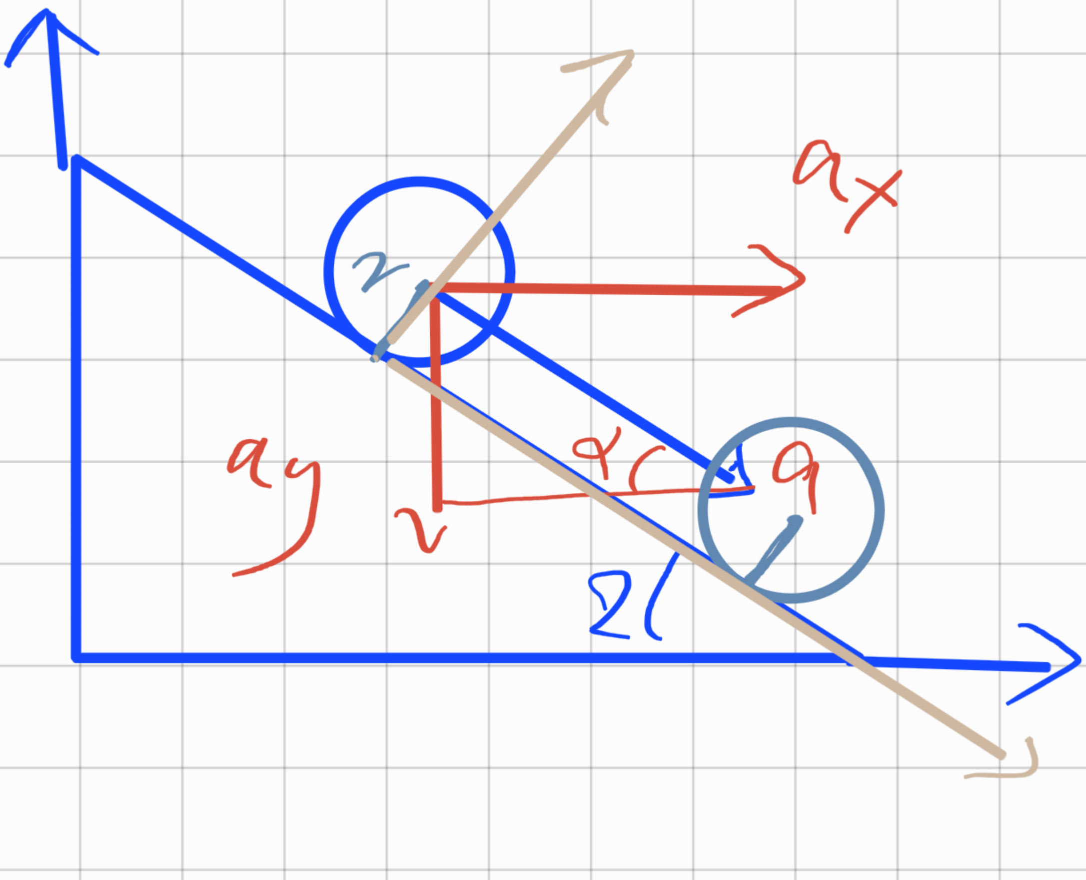
$$I_B = \frac{2}{5} m r^2$$

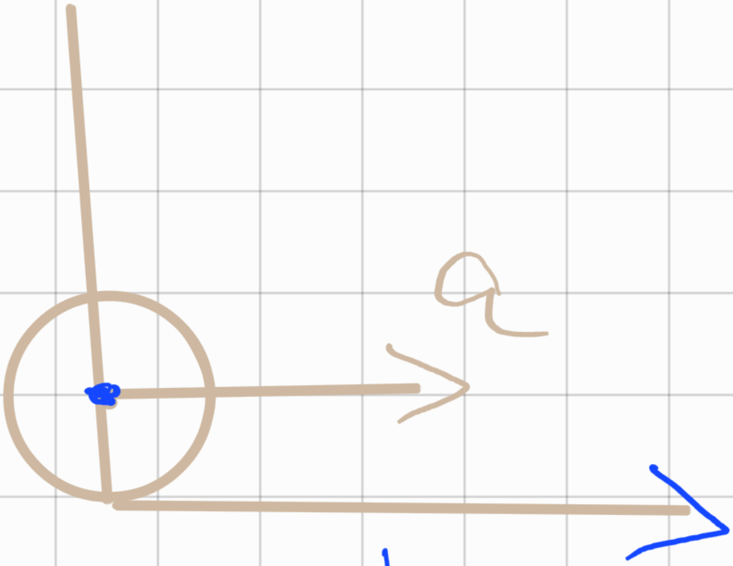
$$a_B = \frac{g \sin(\alpha)}{1 + \frac{\frac{2}{5} m r^2}{m r^2}}$$

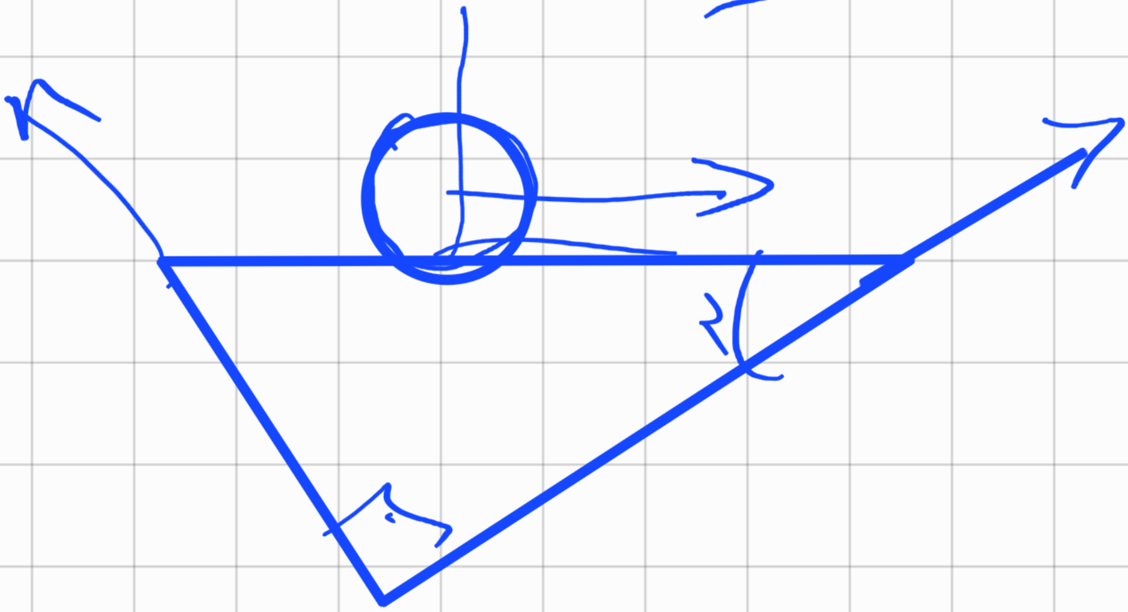
$$a_B = \frac{g \sin(\alpha)}{1 + \frac{2}{5}}$$

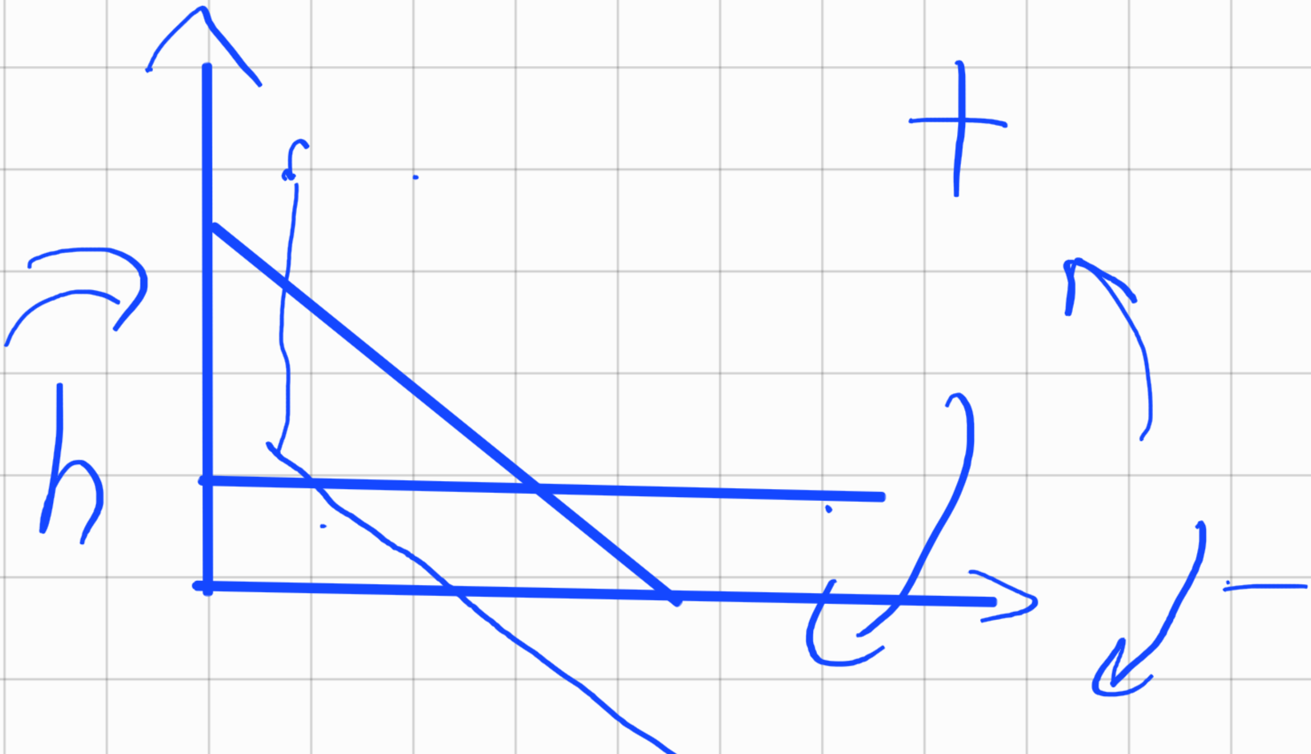
$$a_S = \frac{g \sin(\alpha)}{1 + \frac{2}{3}}$$

$$
\begin{cases}
\dfrac{ds}{dt} = v \\[2ex]
\dfrac{dv}{dt} = a = \dfrac{g\sin(\alpha)}{1 + \dfrac{I}{mr^2}}
\end{cases}
$$




a




h
t
+
−

$$R(\alpha)=\begin{bmatrix}\cos(\alpha) & -\sin(\alpha)\\ \sin(\alpha) & \cos(\alpha)\end{bmatrix}$$

$$\begin{bmatrix}x_r\\ y_r\end{bmatrix}=\begin{bmatrix}x\\ y\end{bmatrix}\begin{bmatrix}\cos(\alpha) & -\sin(\alpha)\\ \sin(\alpha) & \cos(\alpha)\end{bmatrix}$$

$$x_r = x\cos(\alpha) - y\sin(\alpha)$$
$$y_r = x\sin(\alpha) + y\cos(\alpha)$$

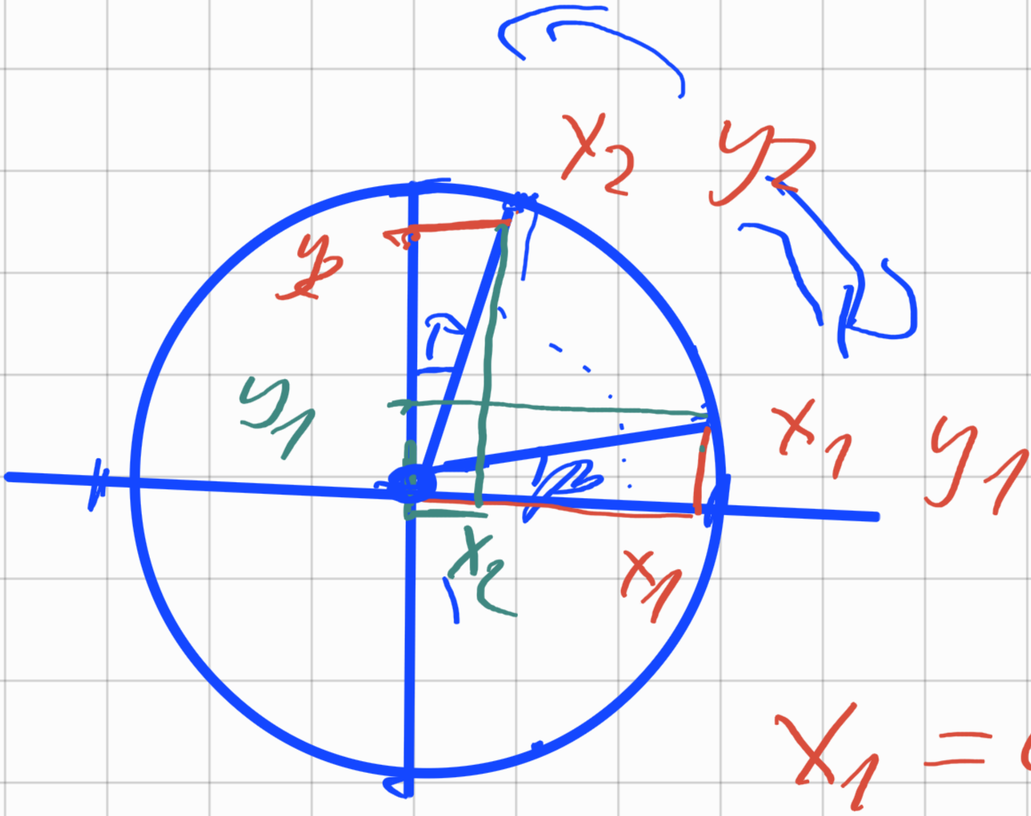
$$-\alpha$$

$$y_r = y_r + h$$

$$\frac{d\beta}{dt} = \omega$$

$$\frac{dv}{dt} = \varepsilon = \frac{a}{r} =$$

$$\frac{g \sin(\alpha)}{r\left(1+\frac{I}{mr^2}\right)}$$



$$x_1 = y_2$$
$$x_2 = y_1$$

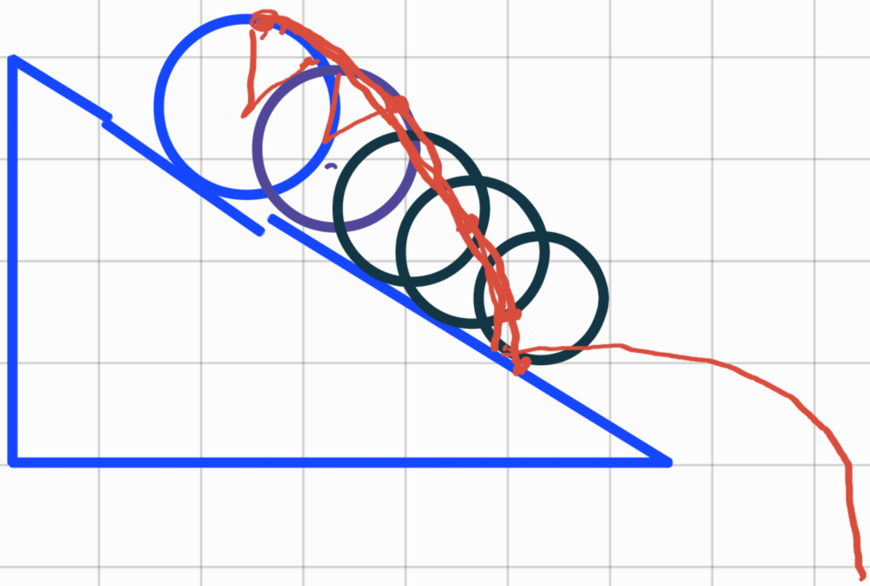
$$x_2 = y_1$$
$$y_2 = x_1$$

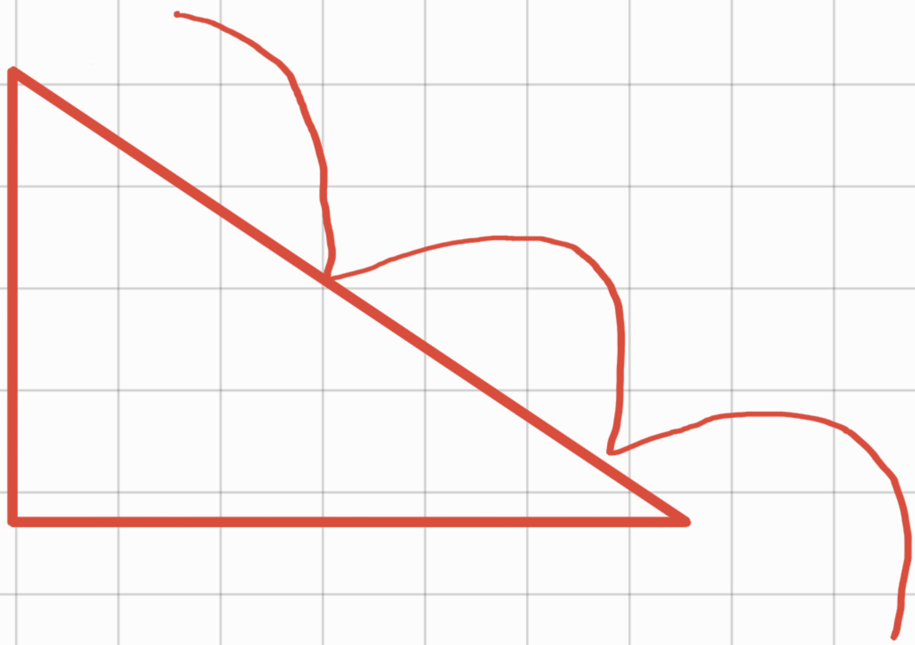
$$x_1 \quad y_1$$

$$x_2 = y_1$$
$$y_2 = x_1$$

$$x = r \cdot \sin(\beta) + x_m$$

$$y = r \cdot \cos(\beta) + y_m$$






r
2πr