

Reemplazo los valores calculados de P_α y P_β :

$$E = \frac{1}{2} I_1 \dot{\beta}^2 + V_{\text{eff}}$$

con

$$V_{\text{eff}} = \frac{1}{2} \frac{(P_\alpha - \frac{I_3}{I_1} P_\beta \cos \beta)^2}{I_1 \sin^2 \beta} + \frac{1}{2} \frac{P_\beta^2}{I_3} + Mgl \cos \beta$$

$$V_{\text{eff}} = \frac{3 Mgl}{2} \frac{(1 - \cos \beta)^2}{\sin^2 \beta} + \frac{3}{2} \frac{I_1}{I_3} Mgl + Mgl \cos \beta$$

