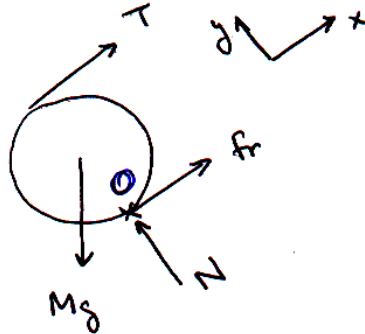


SOLUCIÓN EJERCICIO 14

DCL



$$\sum \vec{F} = 0 \Rightarrow \hat{x}) \quad T + f_r - M g \sin \theta = 0$$

$$\hat{y}) \quad N - M g \cos \theta = 0$$

$$\Rightarrow N = M g \cos \theta$$

$$\sum \vec{\tau} = 0 \quad (\text{cir al punto de contacto } O)$$

$$2RT - M g R \sin \theta = 0$$

$$T = \frac{M g \sin \theta}{2}$$

Entonces

$$f_r = M g \sin \theta - T \leq \mu_e N$$

$$\cancel{M} g \sin \theta - \frac{\cancel{M} g}{2} \sin \theta \leq \mu_e \cancel{M} g \cos \theta$$

$$\tan \theta \leq 2\mu_e \Rightarrow \tan \theta_m = 2\mu_e$$

SOLUCIÓN EJERCICIO 14

$$\text{Como } \cos^2 \theta + \sin^2 \theta = 1 \Rightarrow \frac{1}{\tan^2 \theta} + 1 = \frac{1}{\sin^2 \theta}$$

$$\sin \theta = \frac{\tan \theta}{\sqrt{1 + \tan^2 \theta}}$$

Por lo tanto

$$T = \frac{Mg}{2} \sin \theta_m = \frac{Mg}{2} \frac{\tan \theta_m}{\sqrt{1 + \tan^2 \theta_m}}$$

$$\Rightarrow \boxed{T = \frac{\mu_e Mg}{\sqrt{1 + 4\mu_e^2}}}$$