

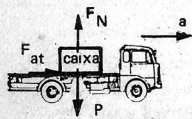
Dinâmica II: Atrito – Plano Inclinado – Componentes da Força Resultante

1. ATRITO

1.1. Atrito Estático: $F_{at} \leq \mu_E F_N$

1.2. Atrito Dinâmico: $F_{at} = \mu_D F_N$

1.3. Exercício Padrão:



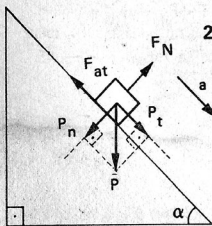
a) PFD: $F_{at} = m a$

b) $F_{at} \leq \mu_E F_N$

c) $a \leq \mu_E g$

caixa não escorrega

2. PLANO INCLINADO



2.1. Forças Atuantes

a) $P_t = P \sin \alpha$

b) $P_n = P \cos \alpha$

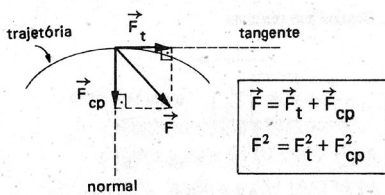
c) $F_{at} = \mu_D P \cos \alpha$

2.2. Sem Atrito: $a = g \sin \alpha$

2.3. Com Atrito: $a = g(\sin \alpha - \mu_D \cos \alpha)$

2.4. Descida em MRU: $\mu_D = \tan \alpha$

3. COMPONENTES DA FORÇA RESULTANTE



3.1. Componente tangencial: $F_t = m |\gamma|$

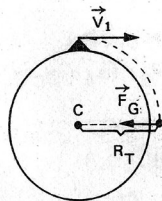
3.2. Componente centrípeta: $F_{cp} = m \frac{V^2}{R}$

3.3. Movimento Uniforme: $F_t = 0$

3.4. Movimento Retilíneo: $F_{cp} = 0$

3.5. Exercícios Padrões

A) Satélite Rasante

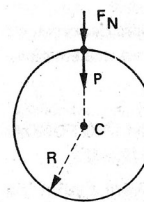


a) $F_G = F_{cp}$

b) $V_1 = \sqrt{g R_T}$

c) $V_1 = 8,0 \text{ km/s}$

B) Globo da Morte

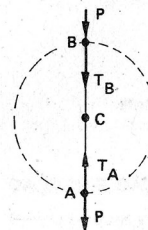


a) $P + F_N = F_{cp}$

b) $V = V_{\min} \iff F_N = 0$

c) $V_{\min} = \sqrt{g R}$

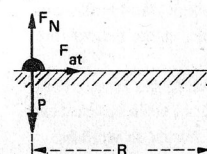
C) Pêndulo



a) $T_A - P = \frac{m V_A^2}{R}$

b) $T_B + P = \frac{m V_B^2}{R}$

D) Curva em plano horizontal



a) $F_N = P = m g$

b) $F_{at} = F_{cp} = \frac{m V^2}{R}$

c) $F_{at} \leq \mu_E F_N$

Ref.: 221226, Cursinho Objetivo

1

