

Dinâmica do MCU

- Aulas 22 e 23 / Pg. 333 / Caderno 3 / Setor A

Apresentação e demais documentos: fisicasp.com.br

Professor Caio – Física

1. Dinâmica do movimento circular uniforme (MCU)

Trajectoria circular

$|\vec{v}|$ é constante
 ω é constante

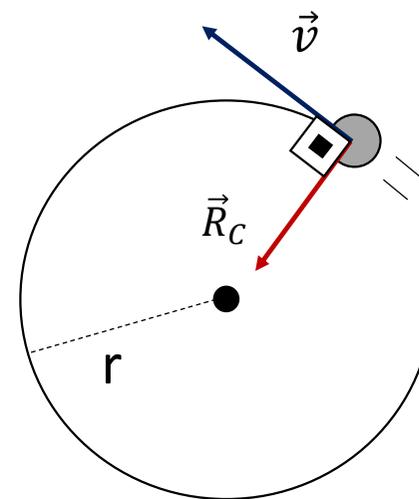
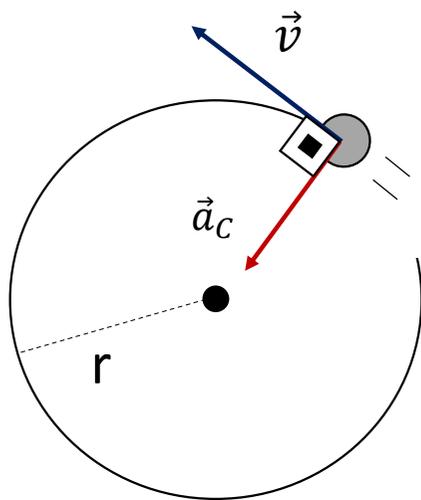
$$v = \omega \cdot r$$

$\frac{m}{s}$ $\frac{rad}{s}$ m

$$\vec{\gamma} = \vec{a}_t + \vec{a}_c \quad \Rightarrow \quad \vec{\gamma} = \vec{a}_c$$

$$\vec{R} = m \cdot \vec{\gamma} \quad \Rightarrow \quad \vec{R}_c = m \cdot \vec{a}_c$$

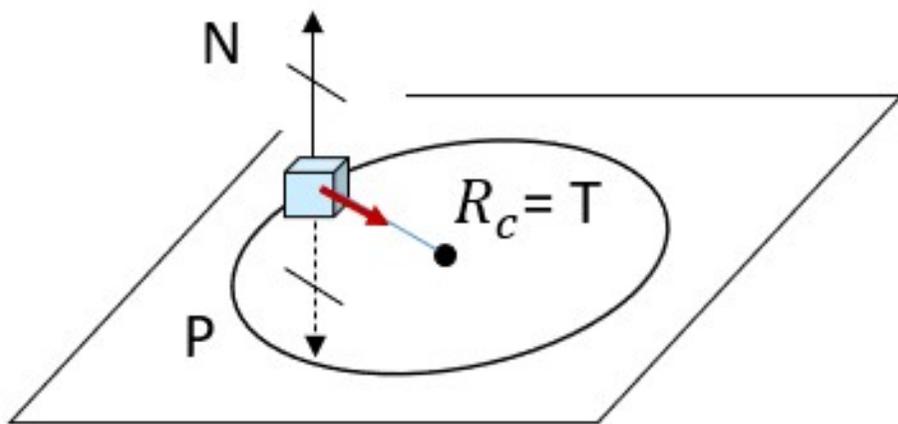
$$a_c = \frac{v^2}{r} \quad \text{ou} \quad a_c = \omega^2 \cdot r$$



...

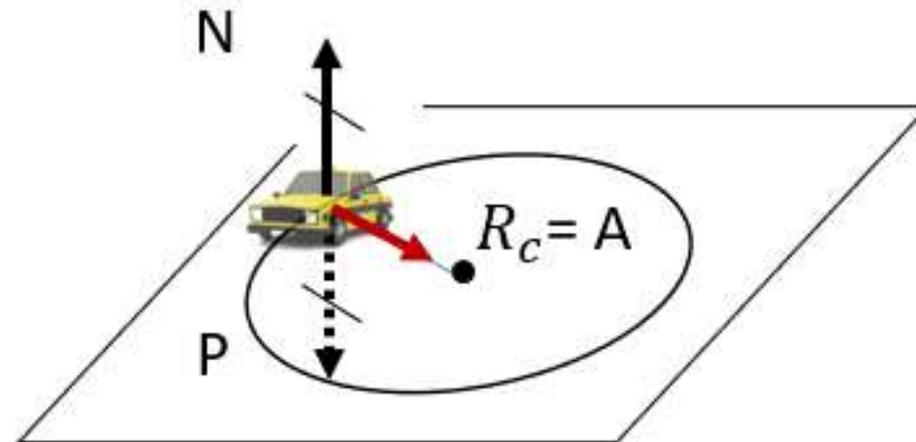
Exemplos de MCU no plano horizontal

Corpo preso a um fio



$$R_c = m \cdot a_c$$
$$T = m \cdot a_c$$

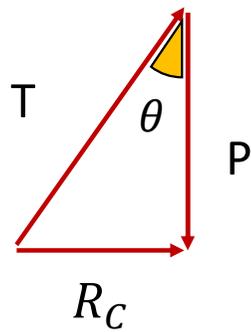
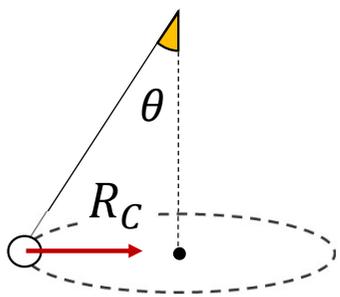
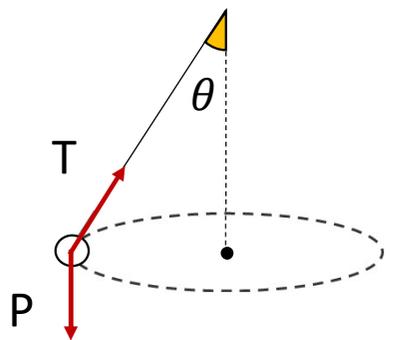
Carro fazendo curva



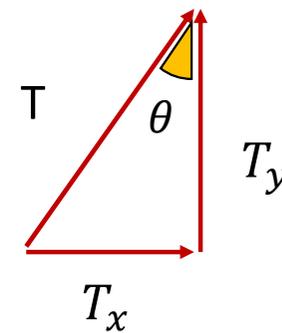
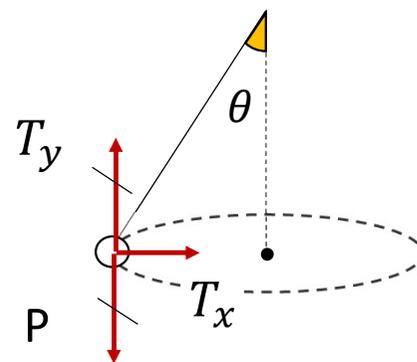
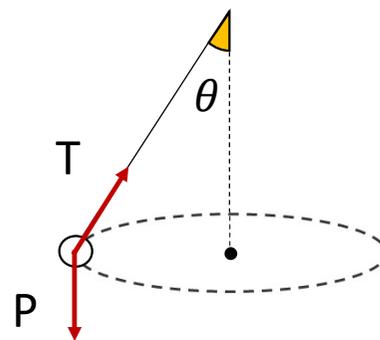
$$R_c = m \cdot a_c$$
$$A = m \cdot a_c$$

Exemplos de MCU no plano horizontal: pêndulo cônico

Linha poligonal



Decomposição

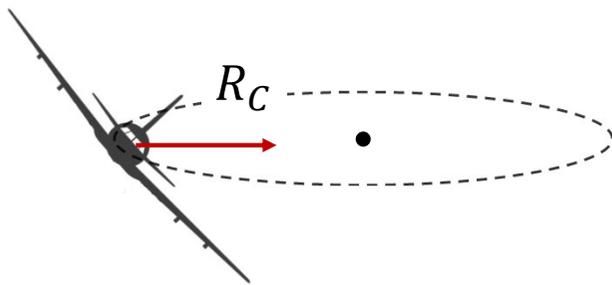
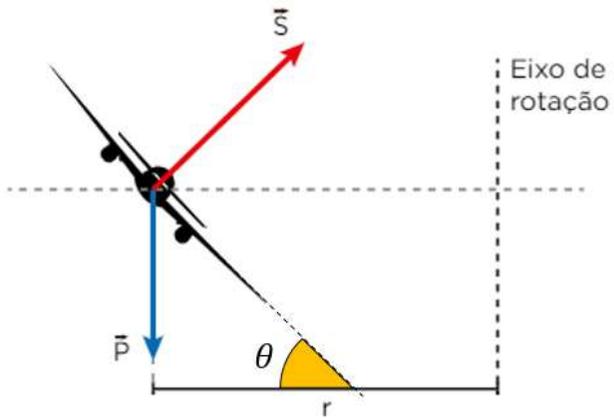


$$R_C = T_x$$

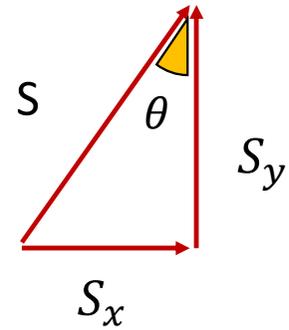
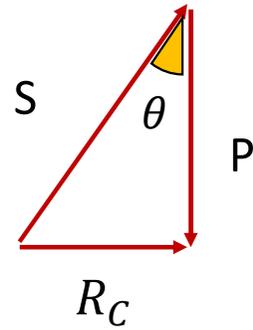
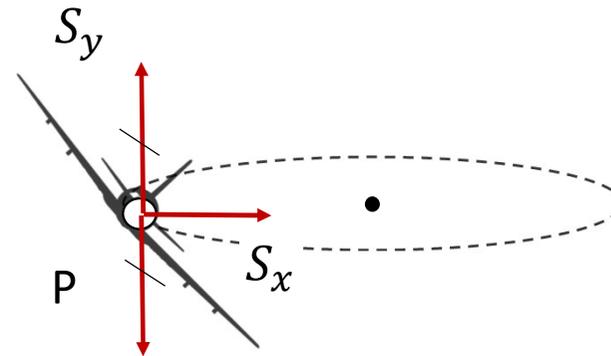
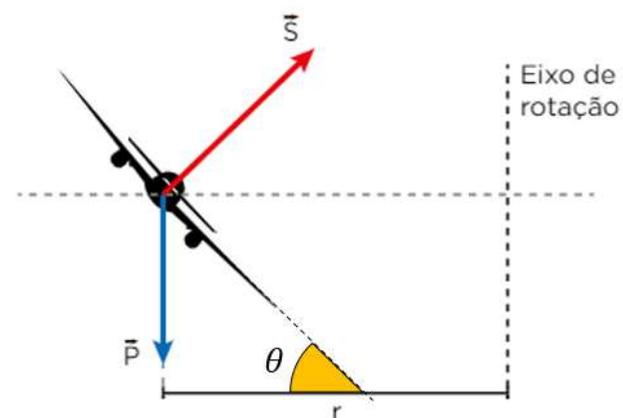
$$P = T_y$$

Exemplos de MCU no plano horizontal: avião fazendo curva

Linha poligonal



Decomposição



$$R_C = S_x$$

$$P = S_y$$

Exercício

1. Calcule a máxima velocidade escalar que um automóvel pode atingir para que seja possível executar uma curva de raio 100 m. Considere uma pista plana e horizontal e que o coeficiente de atrito estático entre os pneus e o solo seja 0,4 e o coeficiente de atrito cinético entre os pneus e o solo seja 0,3.

Resposta: 20 m/s