KEEP CALM AND STUDY PHYSICS

Dinâmica do movimento circular uniforme

Apresentação e demais documentos: **fisicasp.com.br**

Professor Caio – Física / Setor A

1. Dinâmica do movimento circular uniforme (MCU)

Trajetória circular ⟵ ⟶ $|\vec{v}|$ *é constante*

ω *é constante*

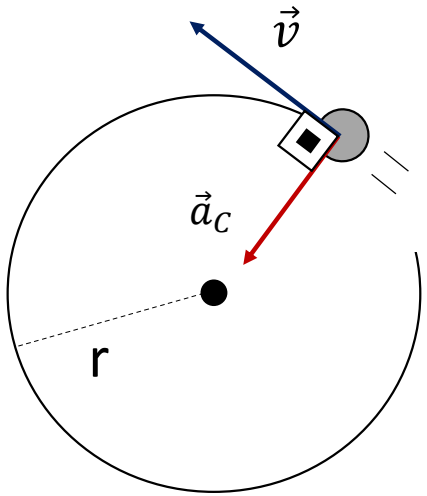
$$v = \omega \cdot r$$

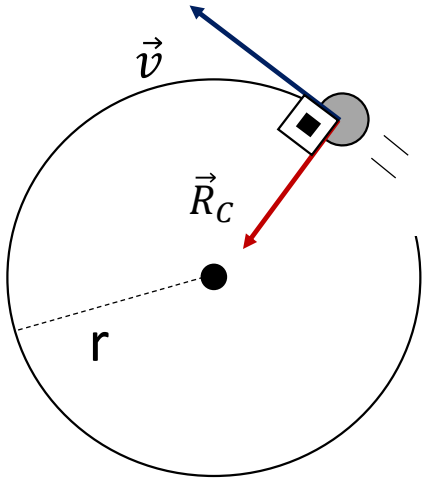
$\frac{m}{s}$ $\frac{rad}{s}$ m

$$\vec{\gamma} = \cancel{\vec{a}_t}^{\,0} + \vec{a}_c \Rightarrow \vec{\gamma} = \vec{a}_c$$

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

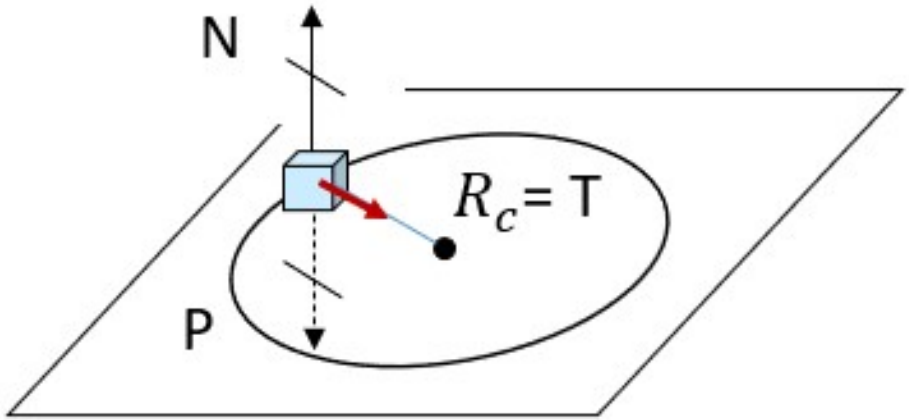
$$a_c = \frac{v^2}{r} \quad \text{ou} \quad a_c = \omega^2 . r$$



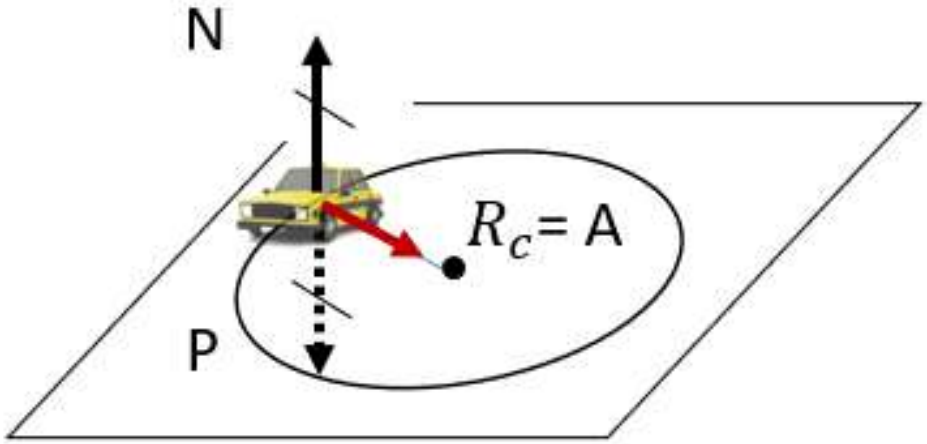


2. Exemplos de MCU no plano horizontal

Corpo preso a um fio

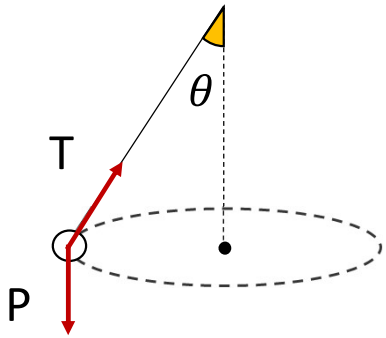


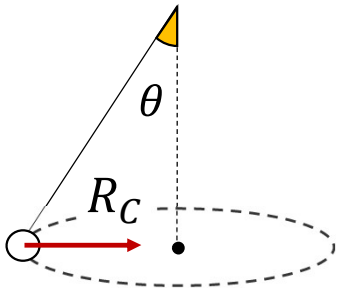
Carro fazendo curva



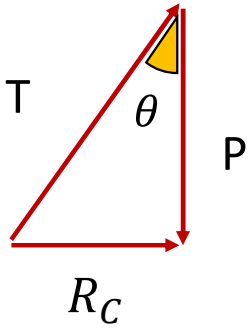
3. Exemplos de MCU no plano horizontal

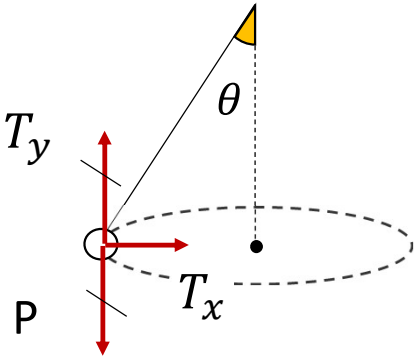
Pêndulo cônico



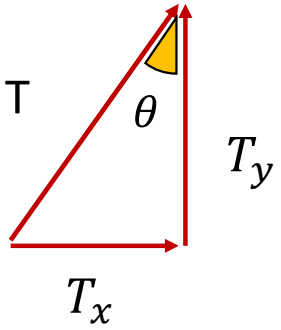


Poligonal





Decomposição

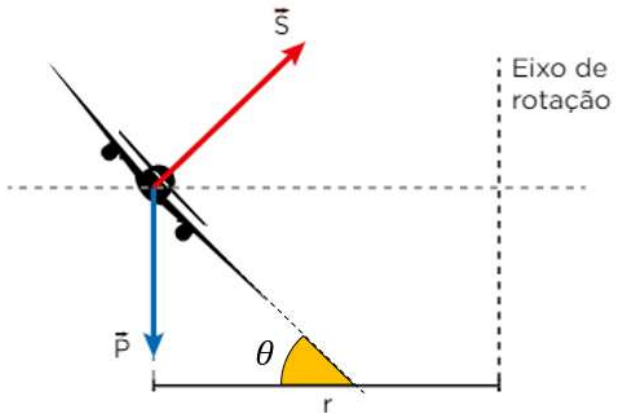


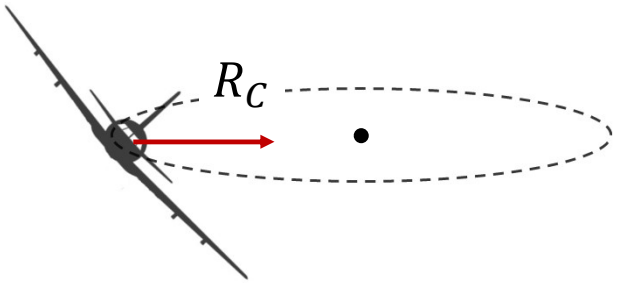
$R_C = T_x$

$P = T_y$

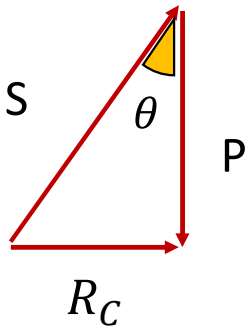
3. Exemplos de MCU no plano horizontal

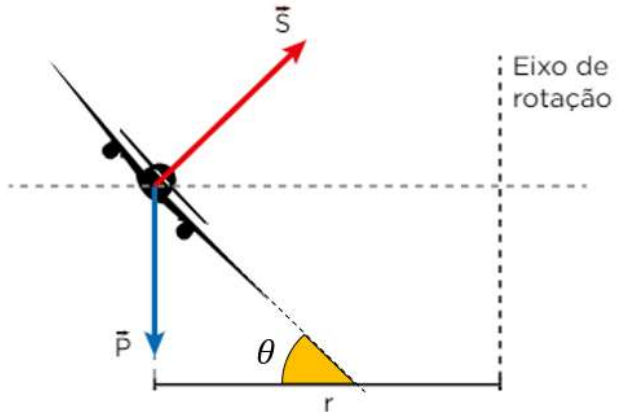
Avião fazendo curva

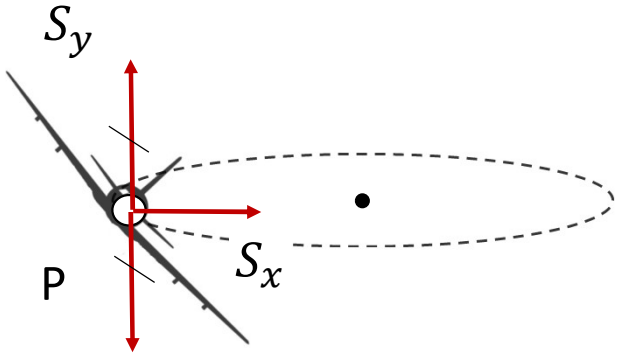




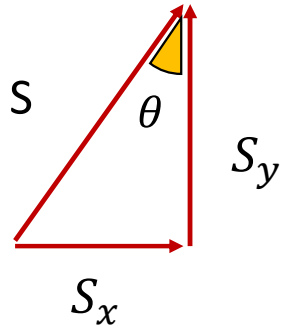
Poligonal







Decomposição

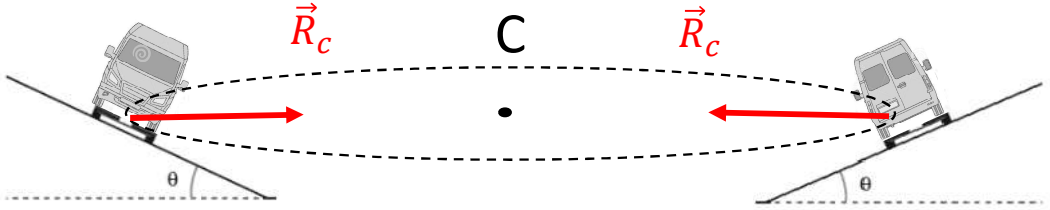


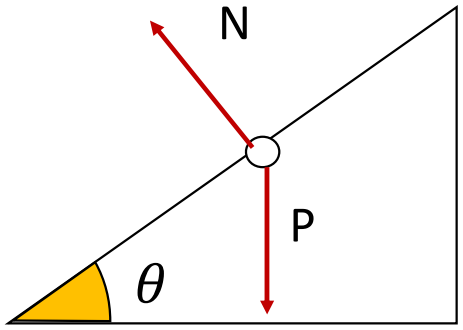
$R_C = S_x$

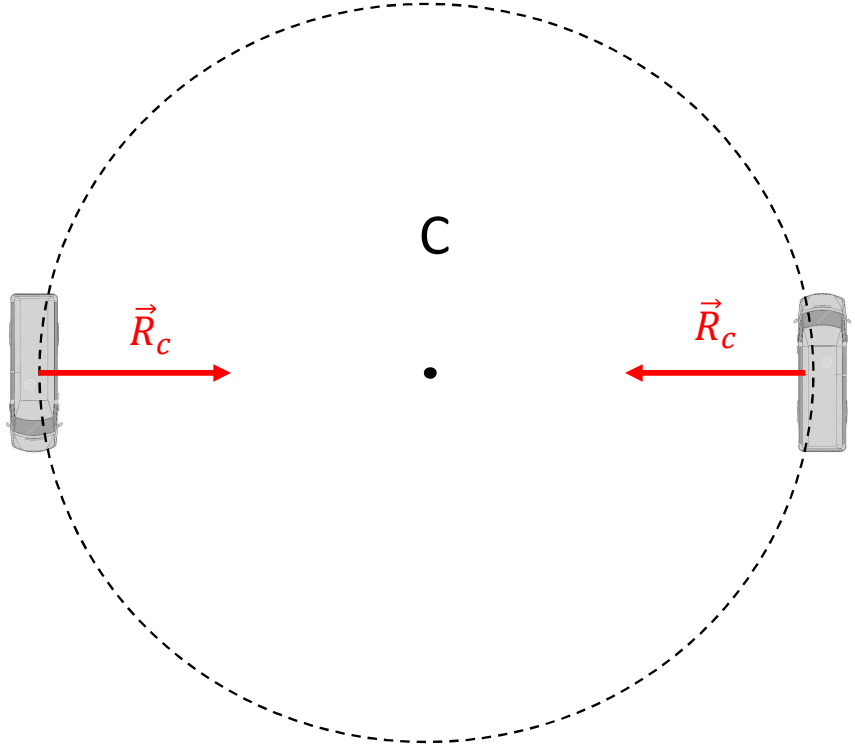
$P = S_y$

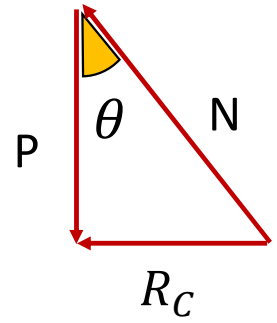
3. Exemplos de MCU no plano horizontal

Pista circular inclinada









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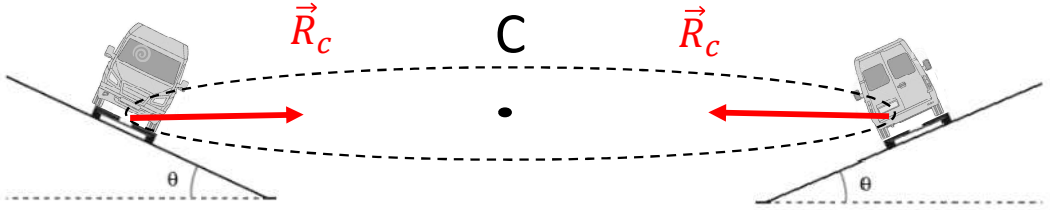
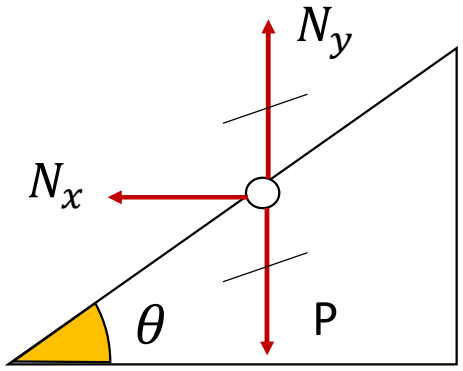
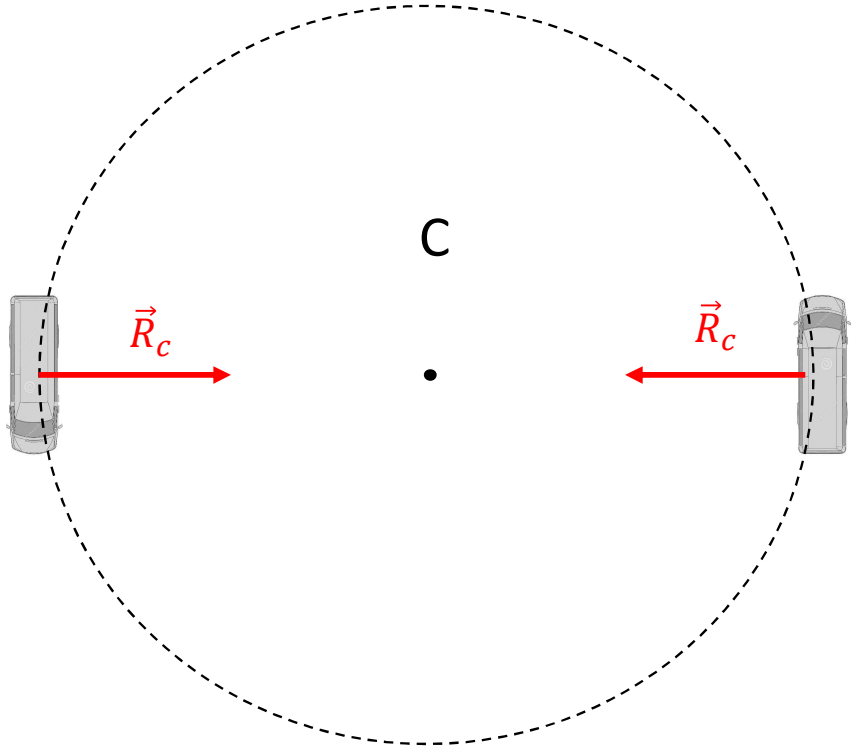
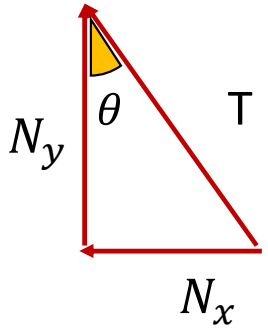
Pista circular inclinada









$R_C = N_x$ $P = N_y$

Um autódromo, cuja pista tem a forma da superfície lateral de um tronco de cone, tem raio de 120 m. Em um trecho dessa pista há uma mancha de óleo, ou seja, o atrito nesse trecho é desprezível. O ângulo de inclinação é tal que sen θ = 0,6 e cos θ = 0,8. A intensidade do campo gravitacional é 10 N/kg. Veja ao lado a situação descrita de maneira esquemática em visão frontal.

Para essa situação, a massa do carro é 600 kg, a intensidade da velocidade na curva é constante, sua altura em relação ao solo não varia e o carro está passando sobre a mancha de óleo.

Determine:

a) A intensidade da força, em newtons, aplicada pela pista sobre o carro.
b) A velocidade que o carro desenvolve.