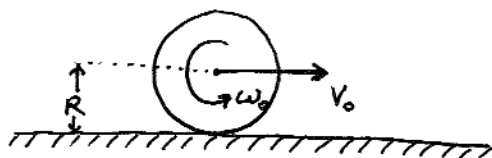


Problema (da "The Feynman Lectures on Physics")

An amusing trick is to press a finger down on a marble, on a horizontal table top, in such a way that the marble is projected along the table with an initial linear speed V_0 and an initial backward rotational speed ω_0 , ω_0 being about a horizontal axis perpendicular to V_0 . The coefficient of sliding friction between marble and table top is constant. The marble has radius R .

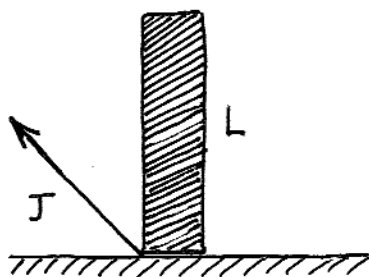
- (a) What relationship must hold between V_0 , R , and ω_0 for the marble to slide to a complete stop?
- (b) What relationship must hold between V_0 , R and ω_0 for the marble to skid to a stop and then start returning towards its initial position, with a final constant linear speed of $\frac{3}{7} V_0$?

[Figure representing the initial state]



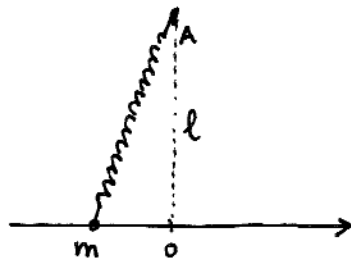
Problema (da "The Feynman Lectures on Physics")

An upright rod of mass M and length L is given an impulse J at its base, directed at 45° upward from the horizontal, which sends the rod flying. What value(s) should J have so that the rod lands vertically again (i.e. upright on the end at which J was applied)?



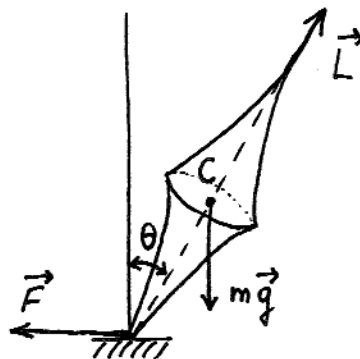
Problema (da "Meccanica", L.D. Landau e E.M. Lifšic)

Trovare la frequenza delle oscillazioni di un punto con massa m , suscettibile di moto su una retta e attaccato a una molla avente l'altro estremo fissato in un punto A . La molla, quando la sua lunghezza è l , è tesa da una forza F_0 .



Problema (da "Fundamental laws of Mechanics", I.E. Irodov)

A spinning top of mass m whose axis forms an angle θ with the vertical precesses about the vertical axis passing through the point of support O . The angular momentum of the top is equal to L , and its centre of inertia is located at the distance l from the point O . Find the magnitude and direction of the vector $\vec{F}$ which is the horizontal component of the reaction force at the point O .



Problema : pendolo conico

Studiare, utilizzando le opportune leggi di conservazione, il moto di una pallina di massa m , attaccata ad un filo inestensibile di massa trascurabile lungo l , soggetta alla forza peso, quando ad essa viene impressa una velocità $\vec{v}_0$ giacente nel piano ortogonale all'asse OO' e ortogonale al raggio vettore $\vec{r}$.

