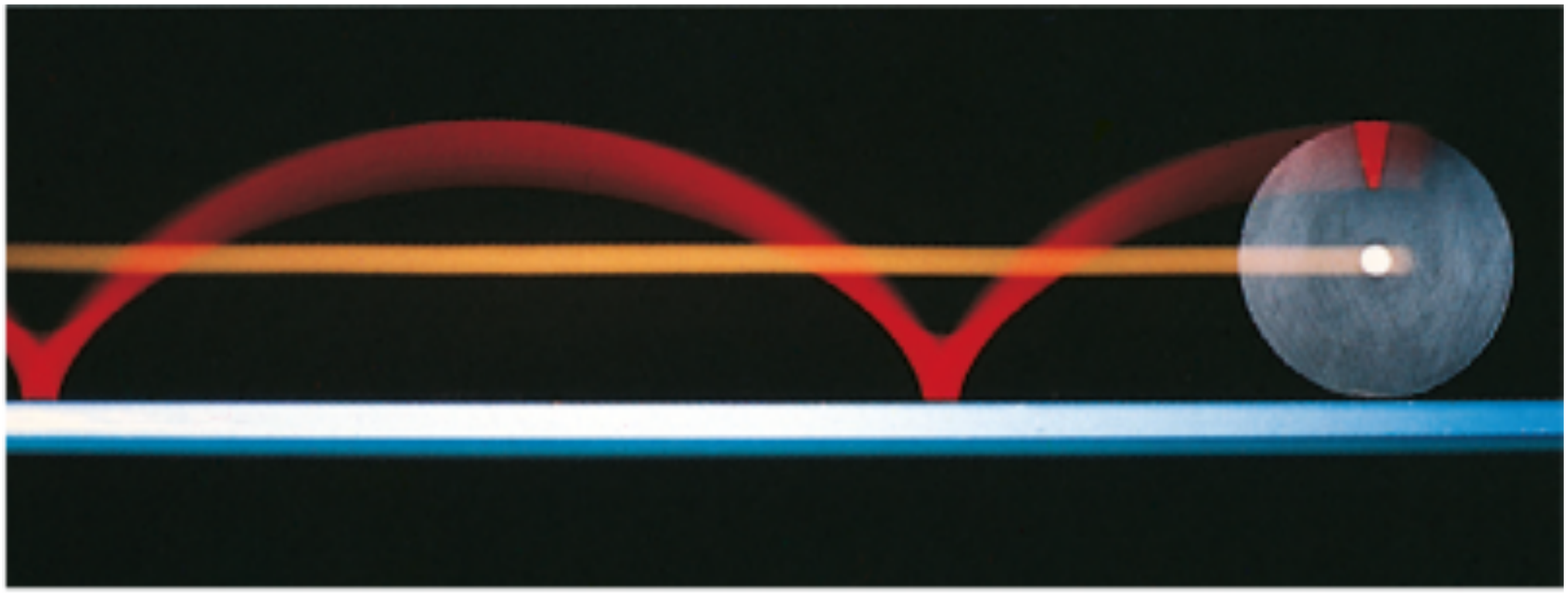
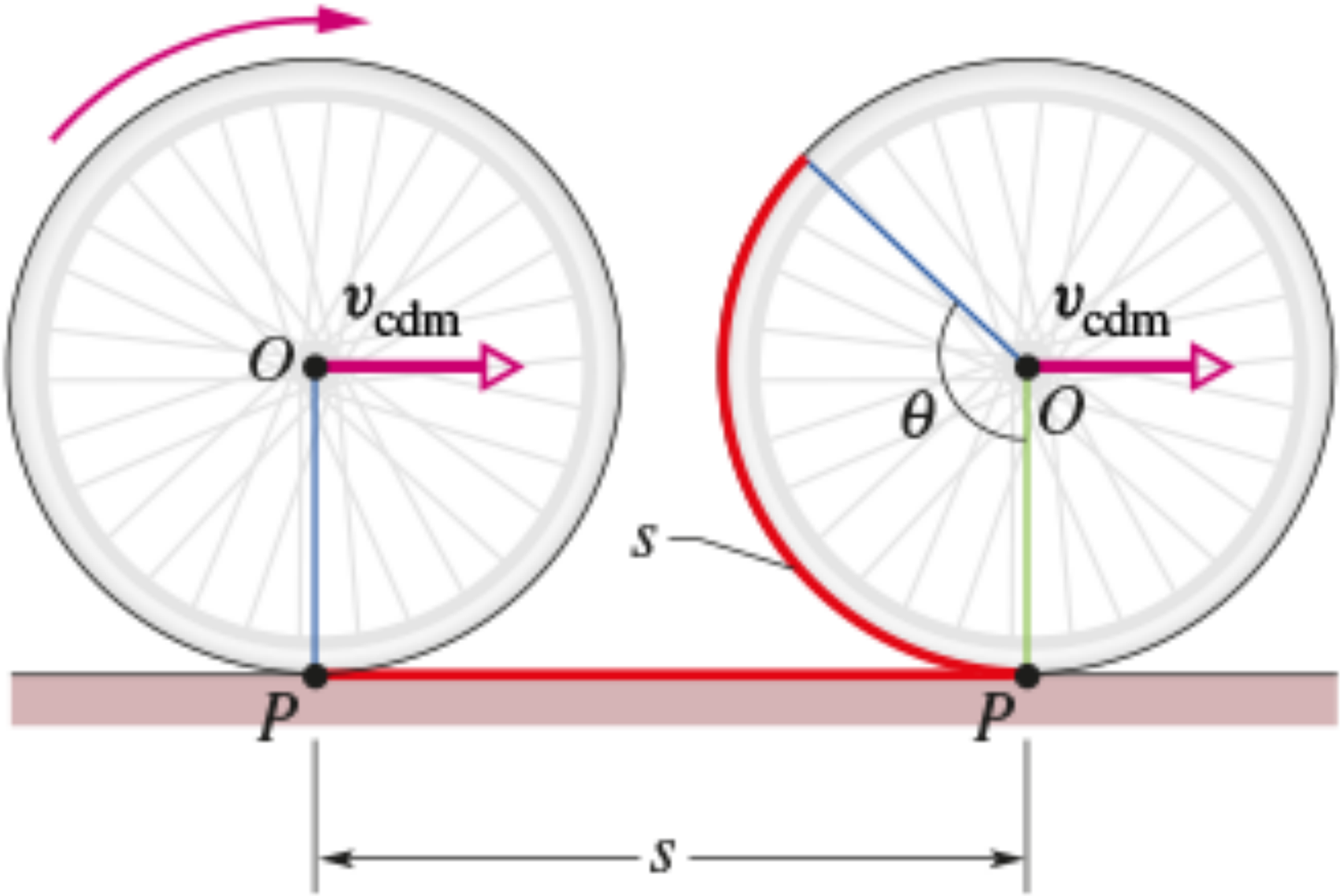
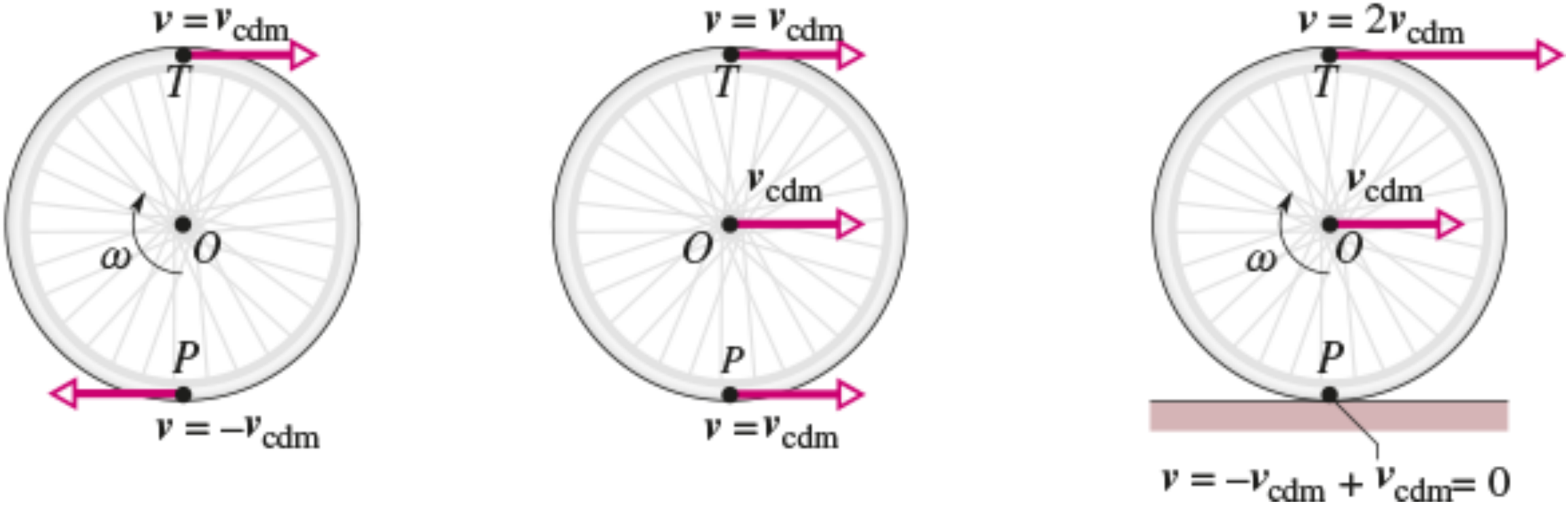
Justin Sullivan/Getty Images, Inc.



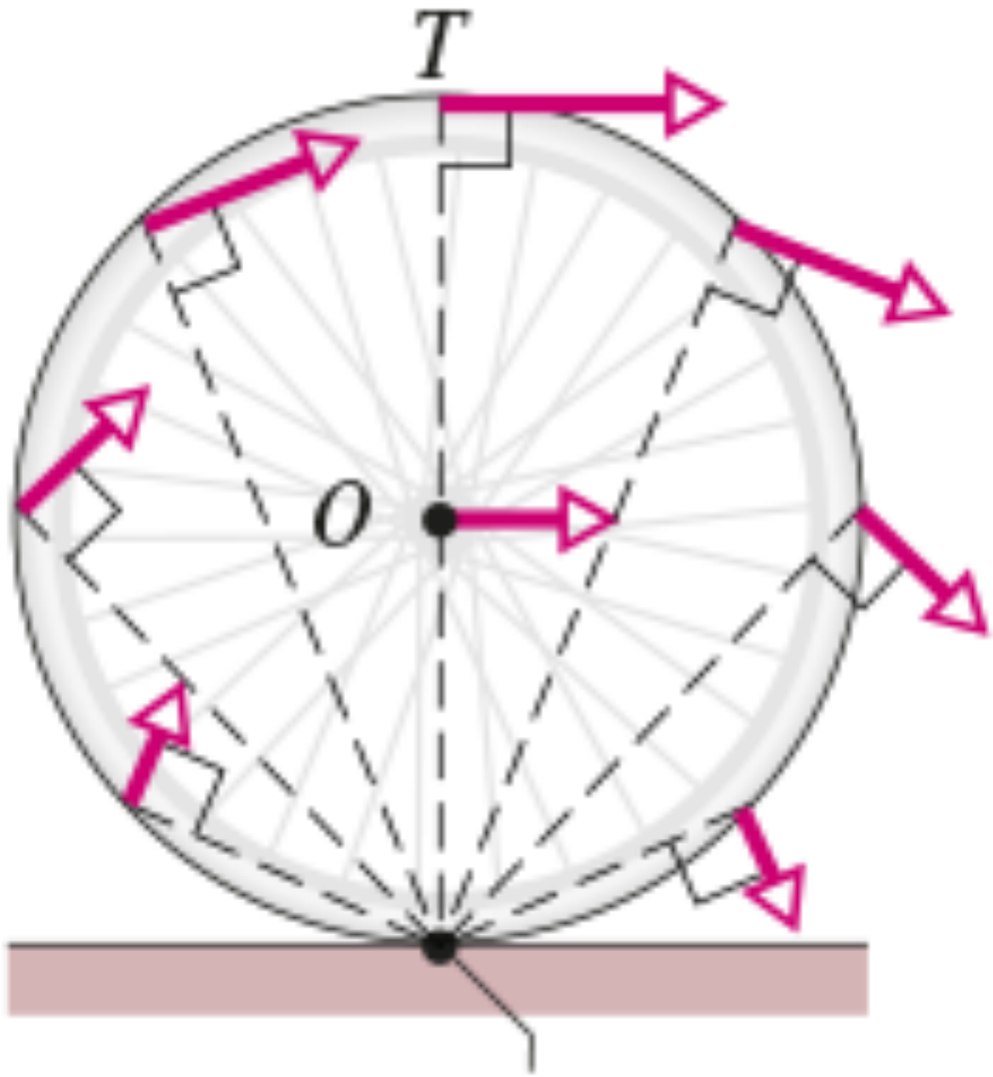
Richard Megna/Fundamental Photographs

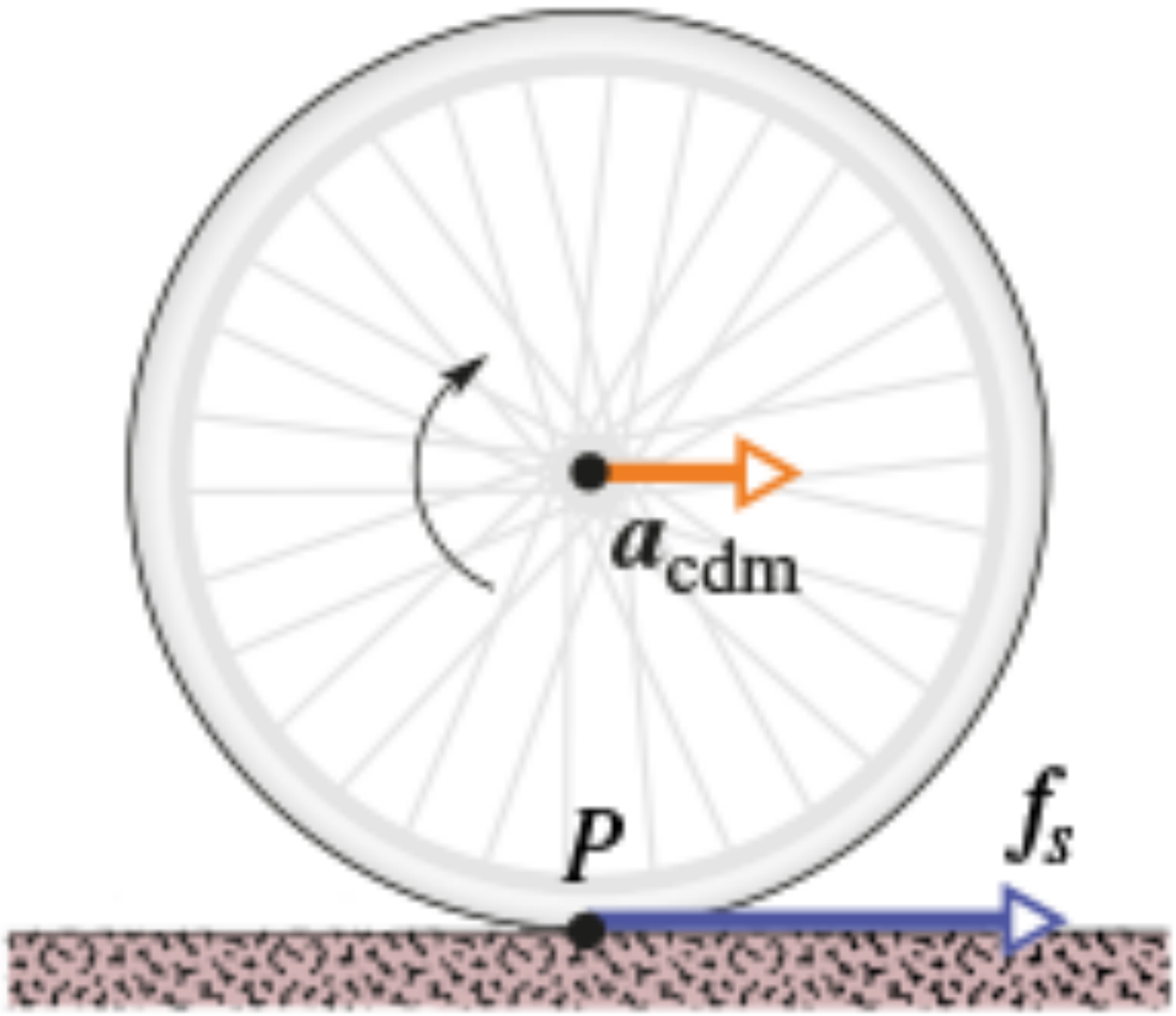


(a) Rotazione pura + (b) Traslazione pura = (c) Moto di rotolamento



Courtesy Alice Halliday

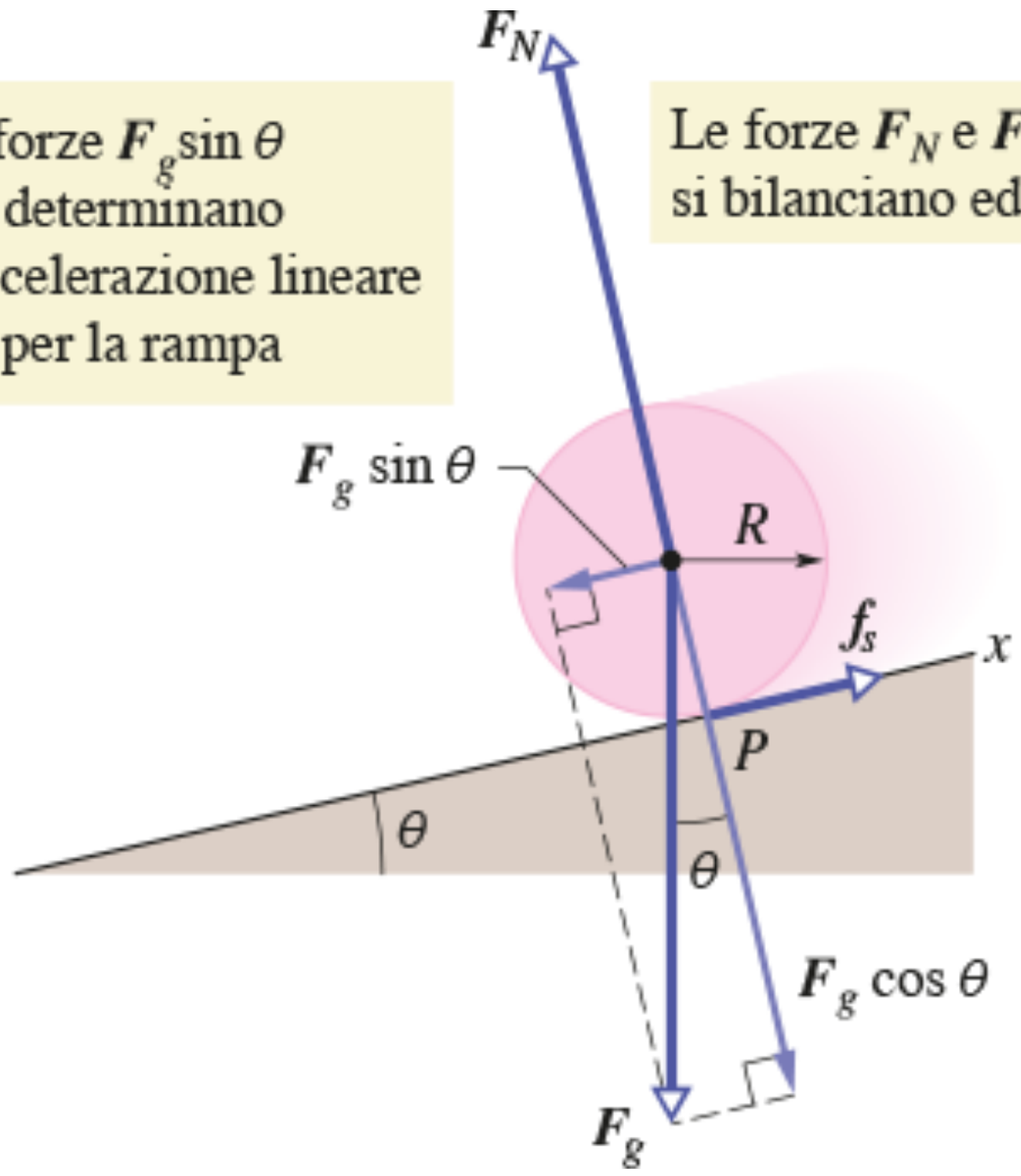


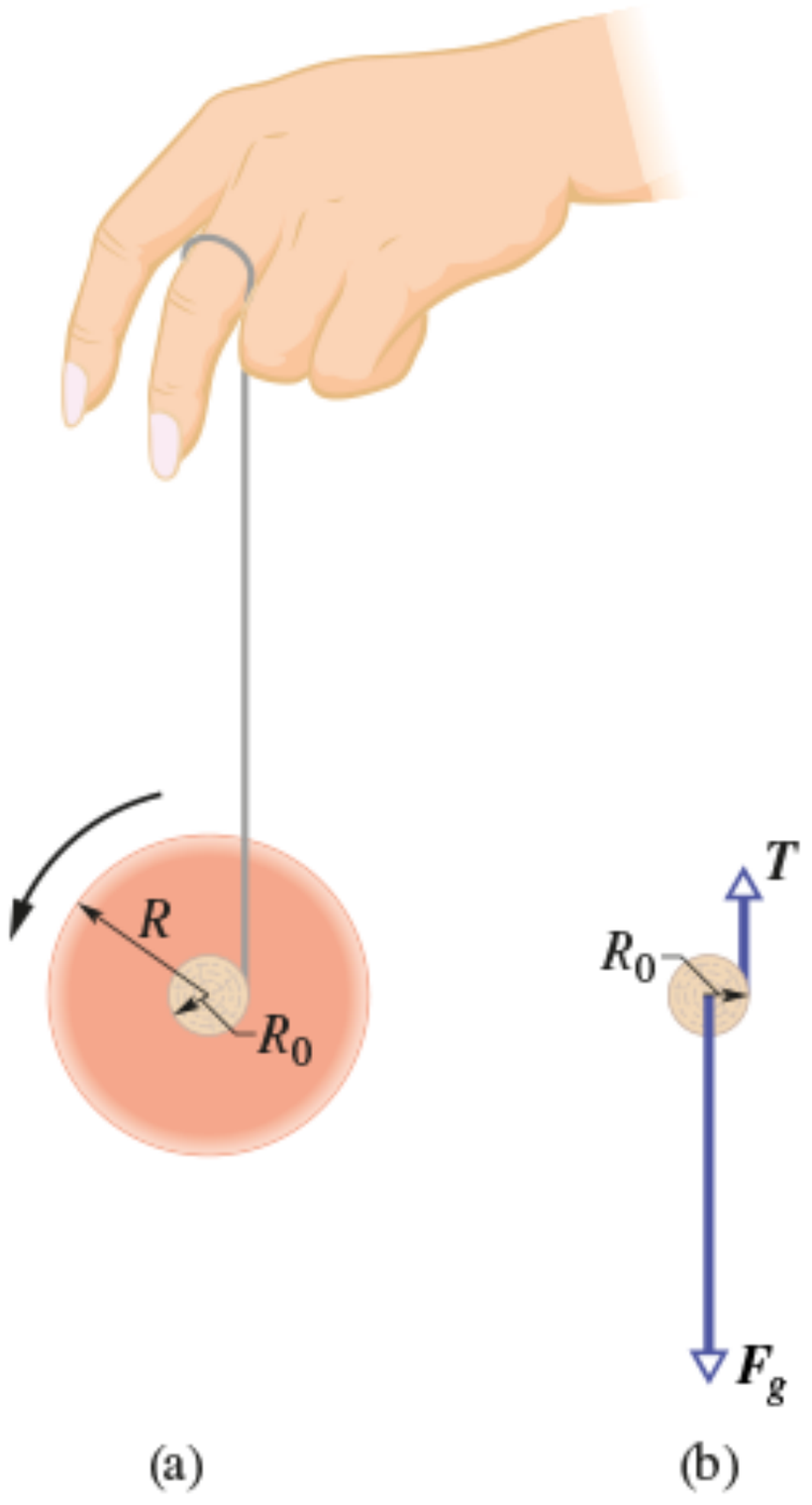


Le forze $F_g \sin\theta$ e f_s determinano l'accelerazione lineare giù per la rampa

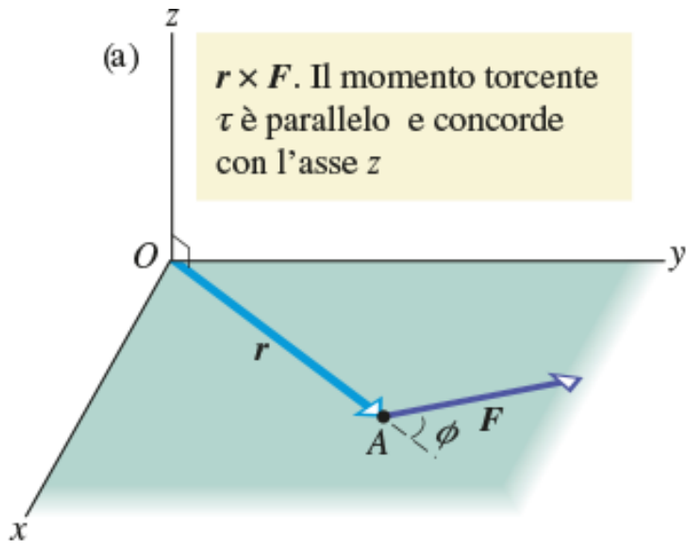
Le forze F_N e $F_g \cos\theta$ si bilanciano ed elidono

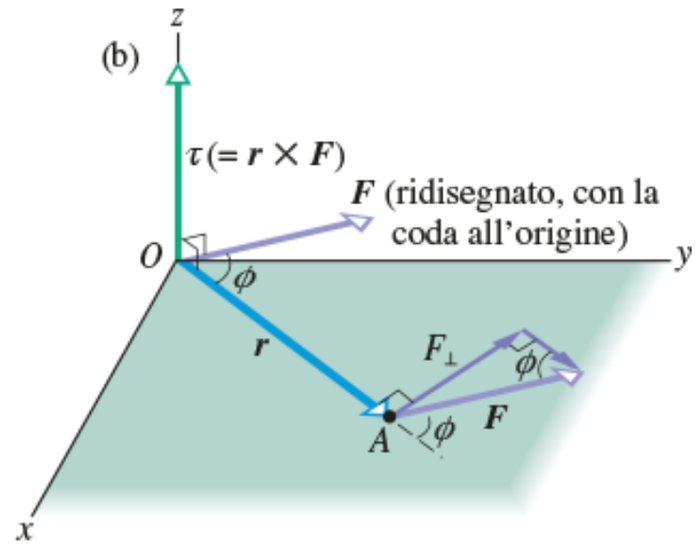
Il momento torcente dovuto a f_s determina l'accelerazione *angolare* attorno al cdm

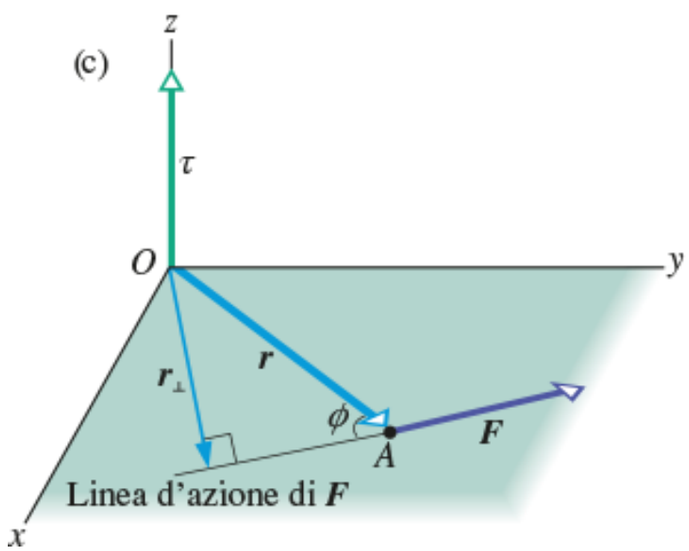


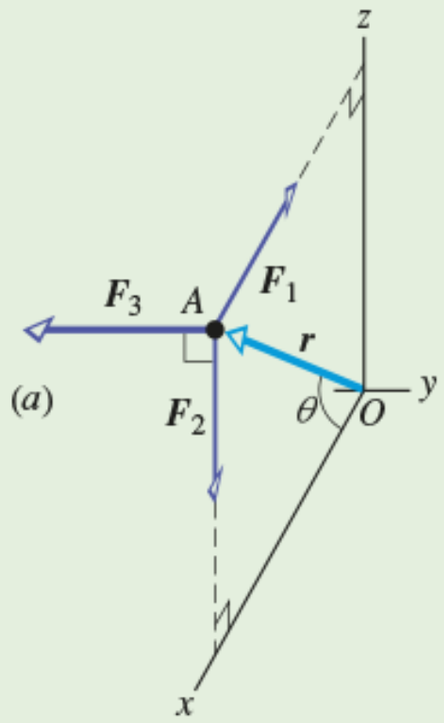


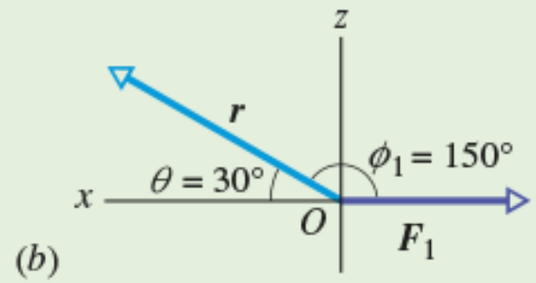
(a) (b)

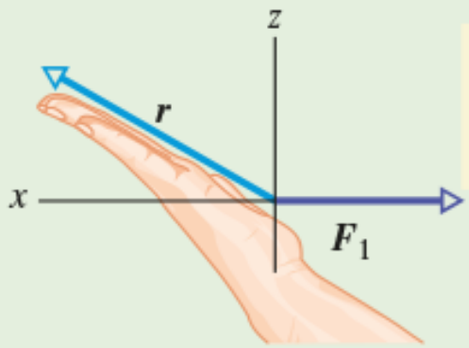




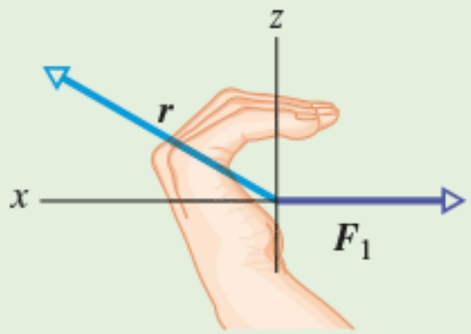


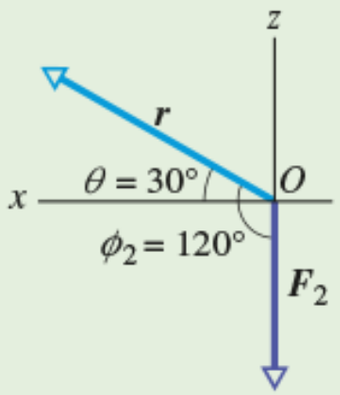


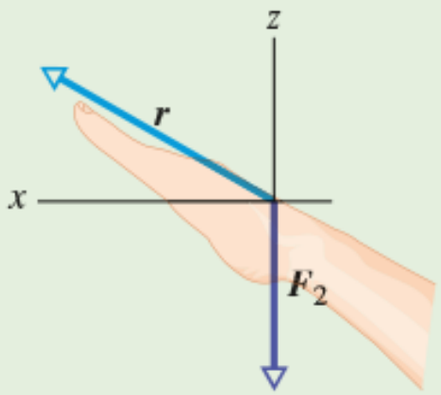




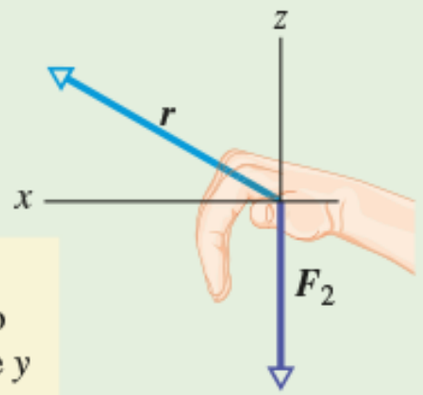
$\boldsymbol{r} \times \boldsymbol{F}_1$. Il momento torcente $\boldsymbol{\tau}_1$ è parallelo e discorde con l'asse y

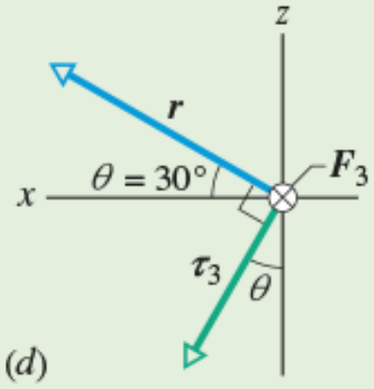


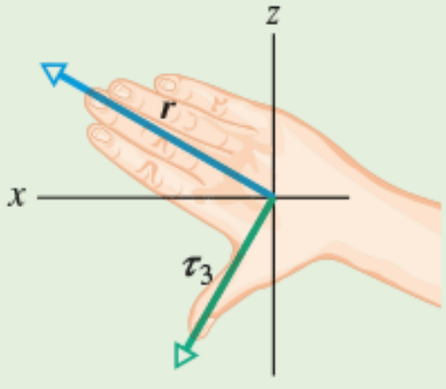




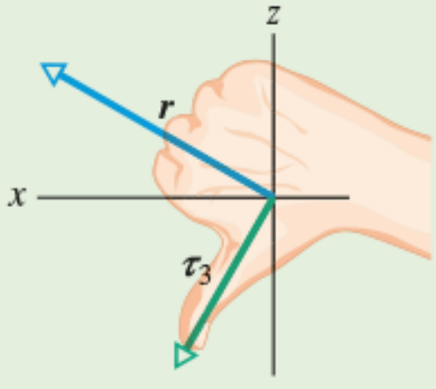
$\boldsymbol{r} \times \boldsymbol{F}_2$. Il momento torcente $\boldsymbol{\tau}_2$ è parallelo e concorde con l'asse y

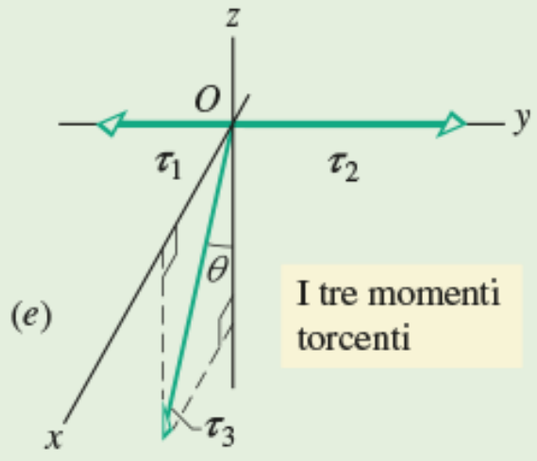




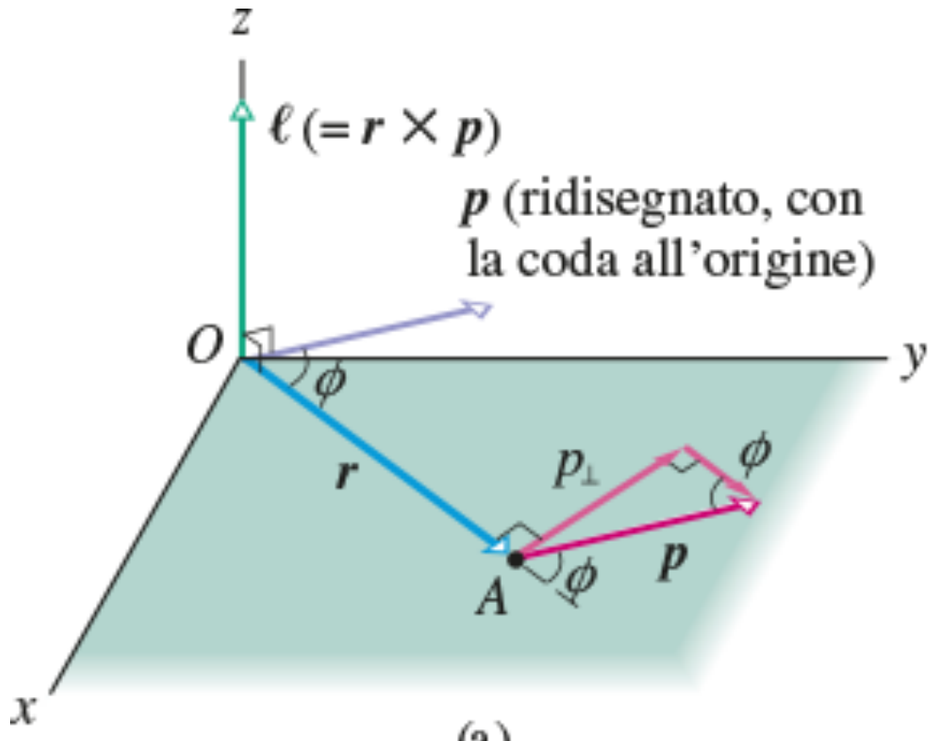


$\boldsymbol{r} \times \boldsymbol{F}_3$. Il momento torcente $\boldsymbol{\tau}_3$ giace nel piano xz

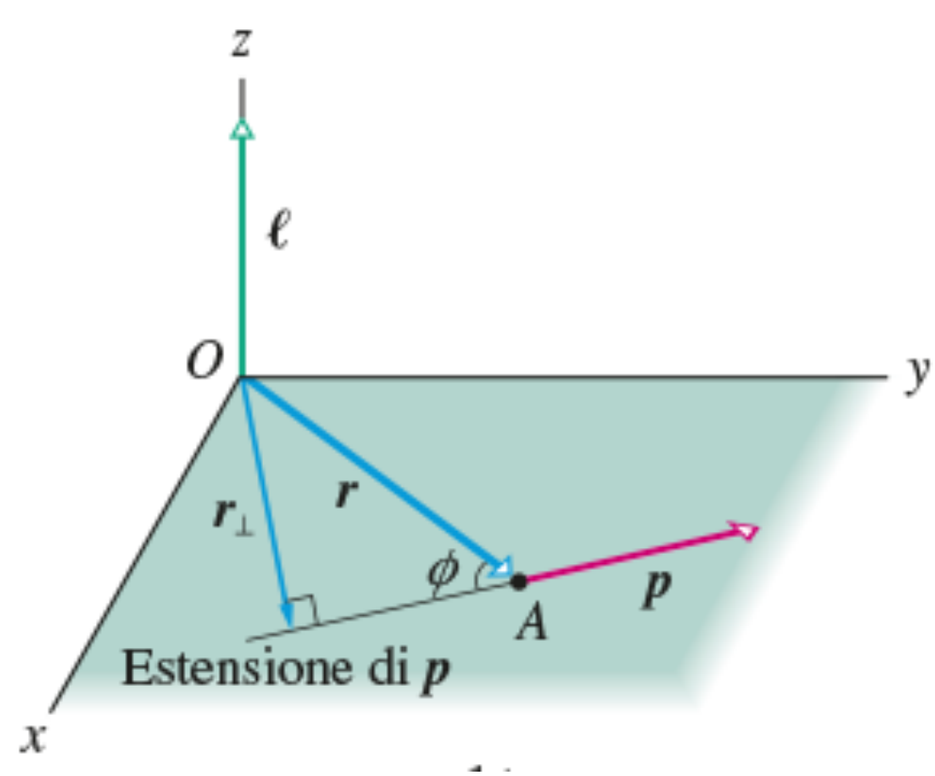


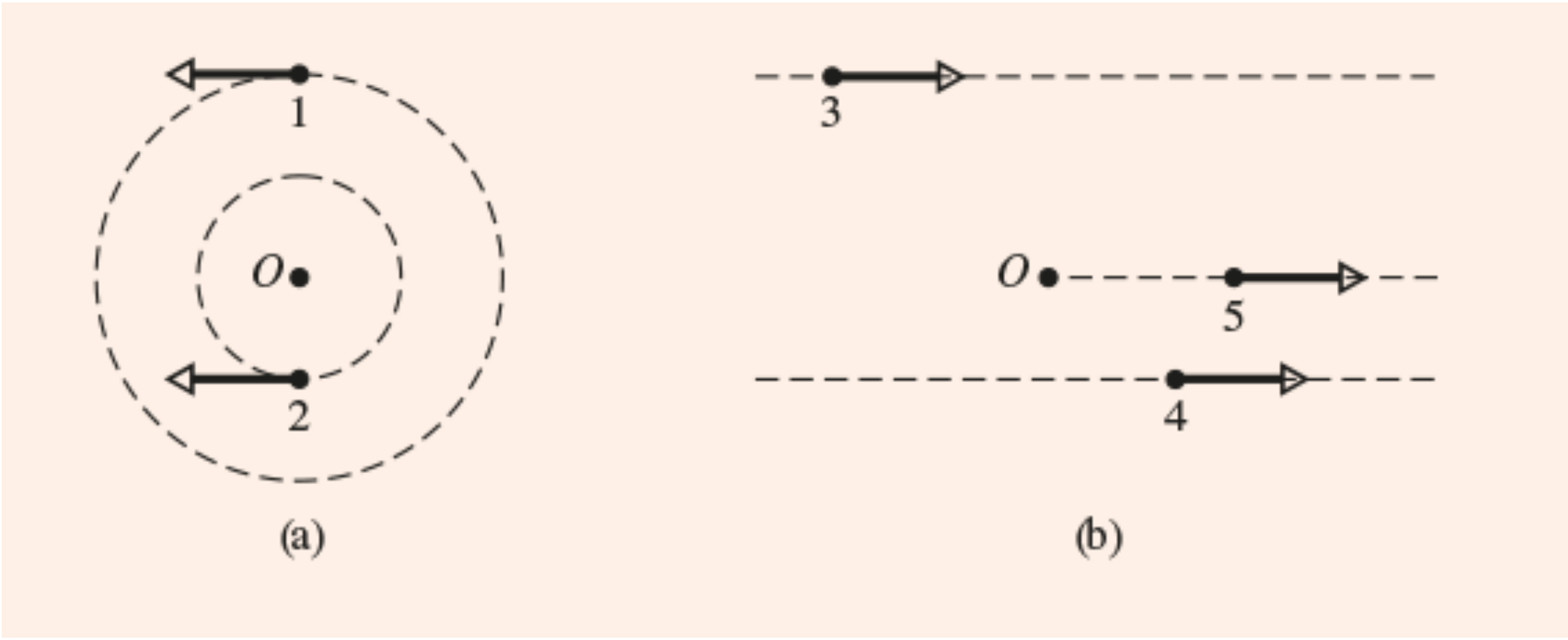


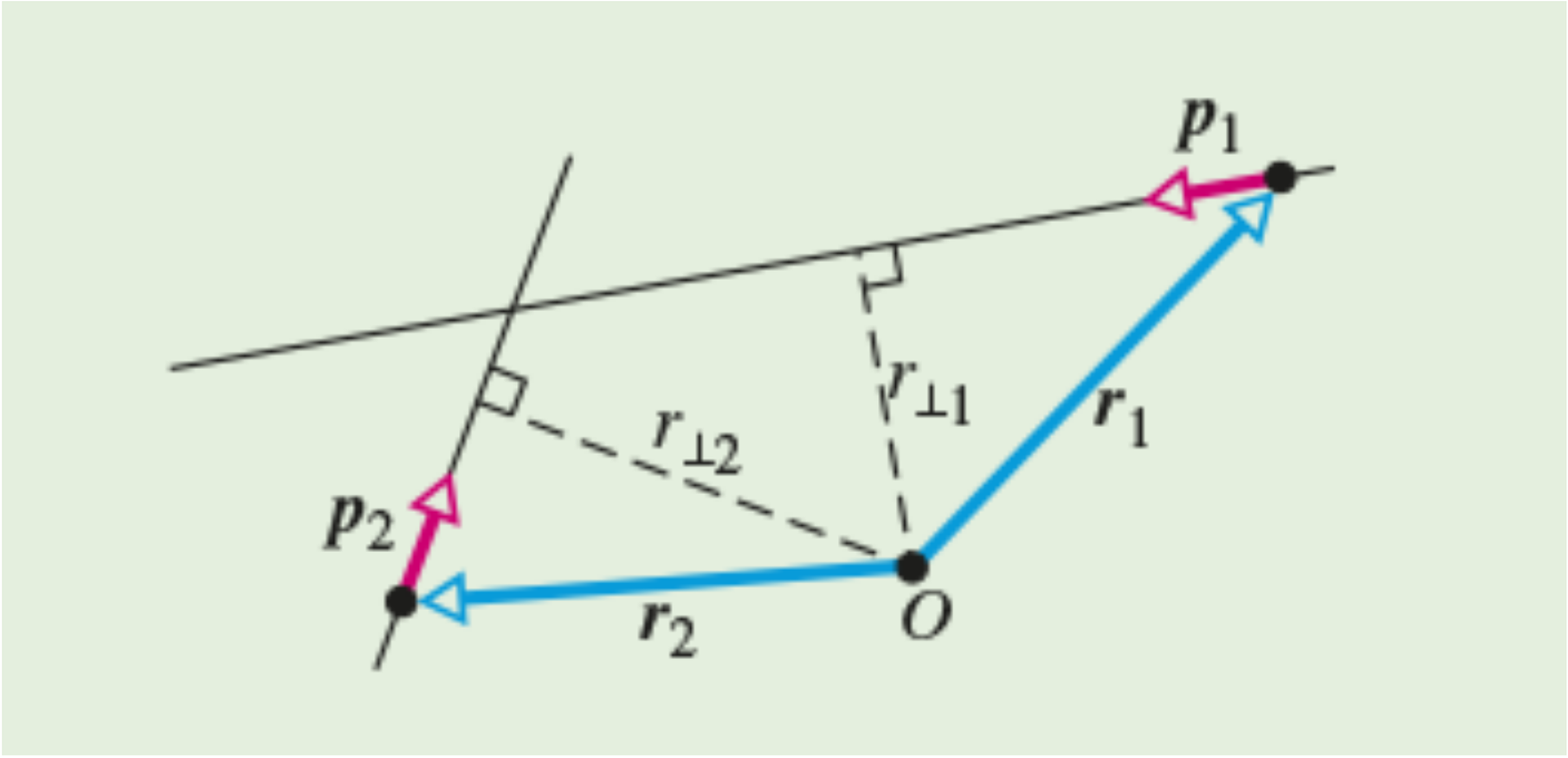
I tre momenti torcenti

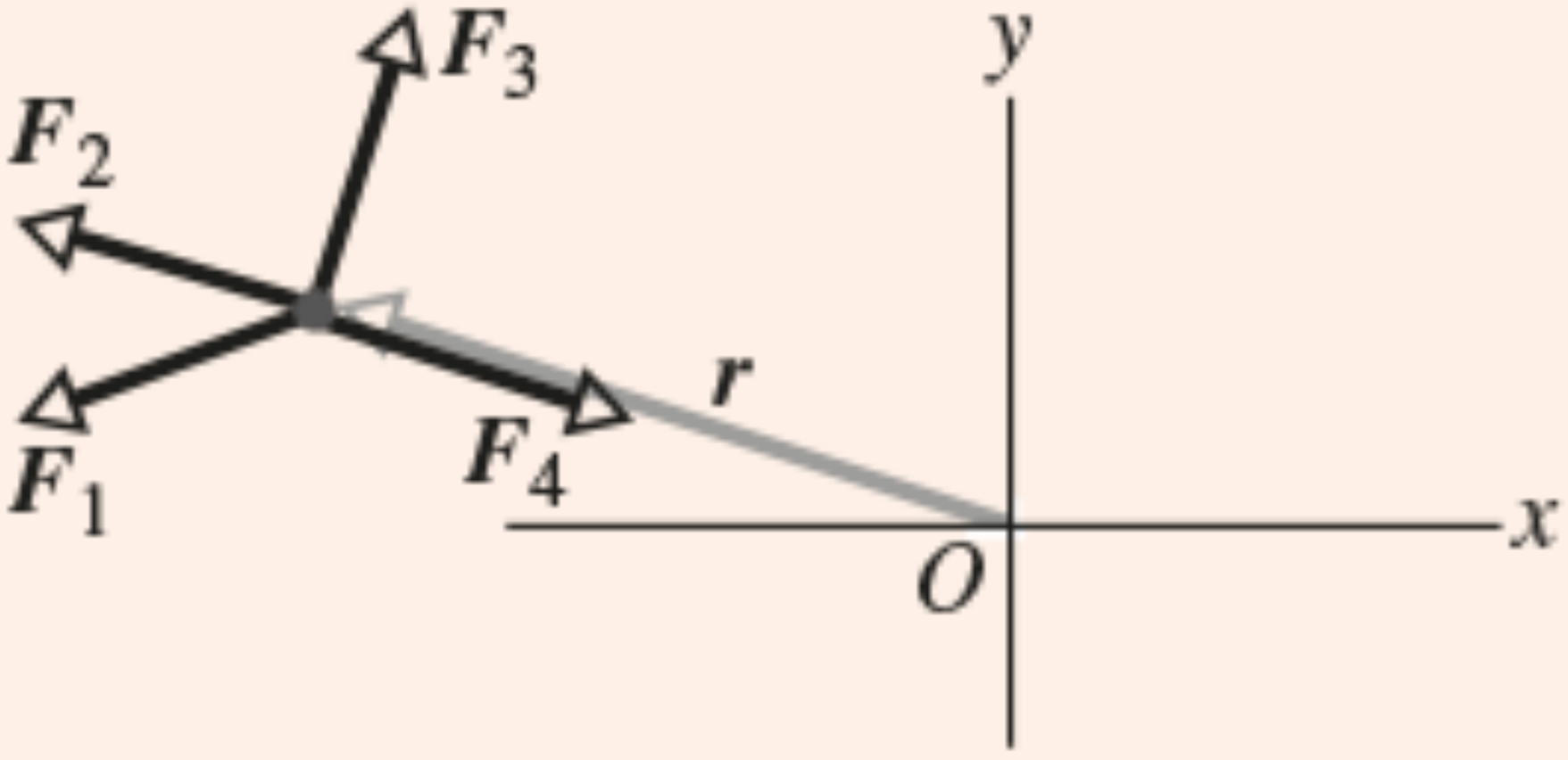


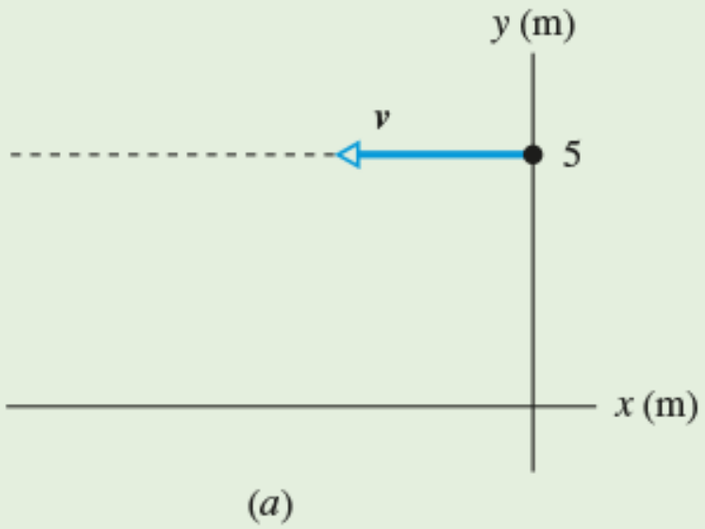
(a)











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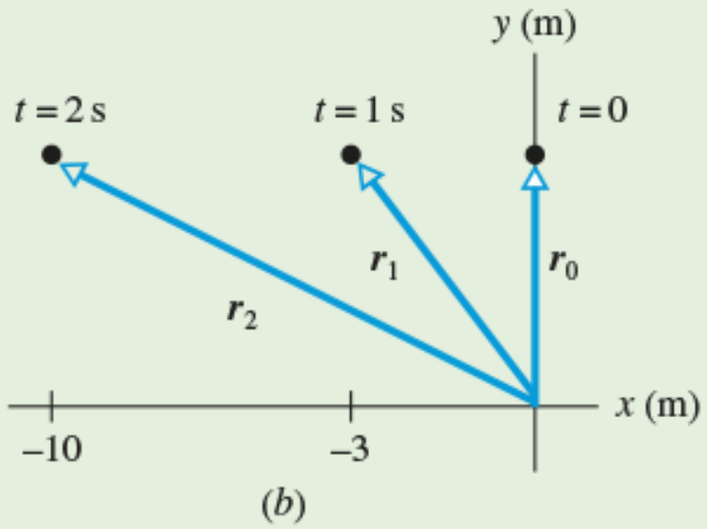

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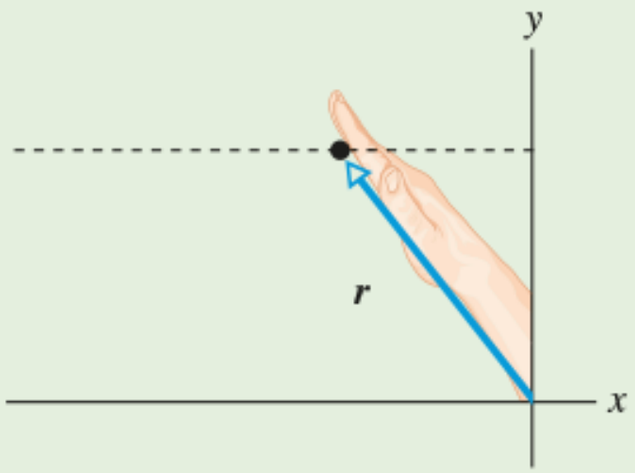
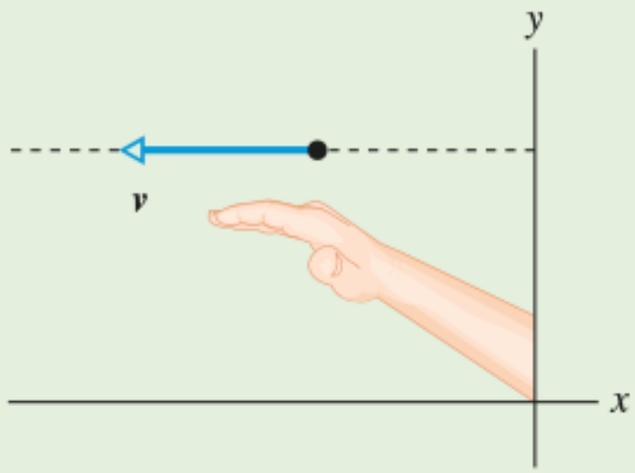
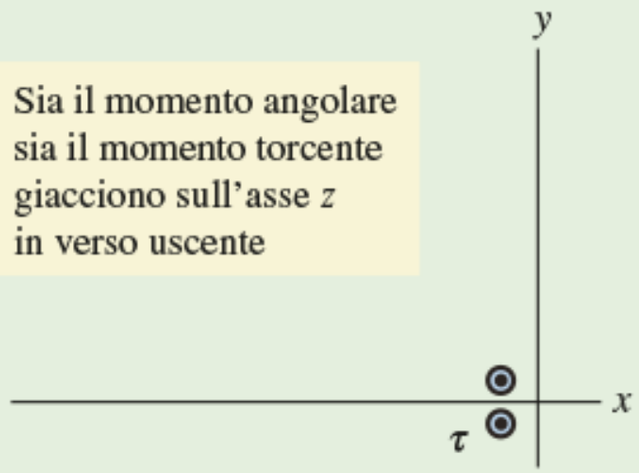


(c)

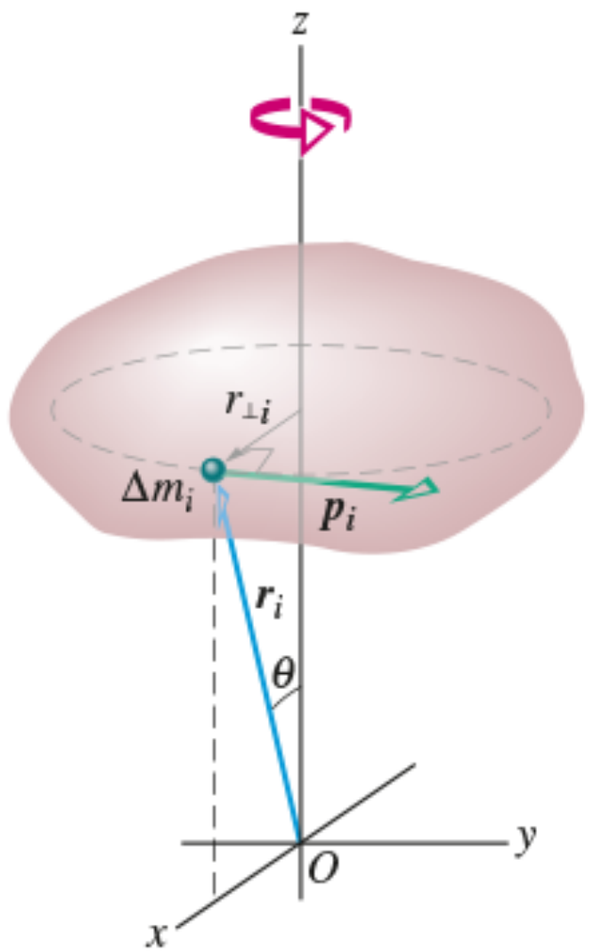


(d)

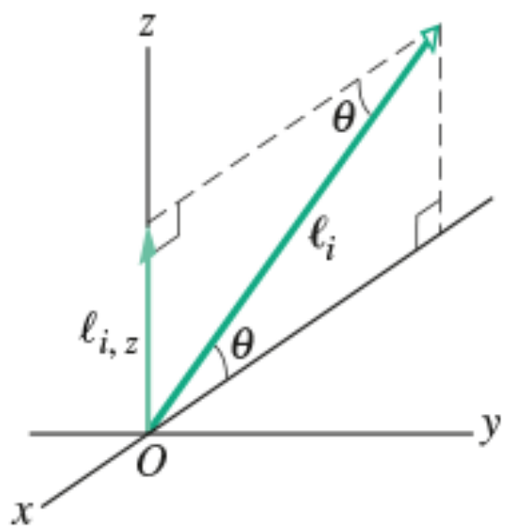
Sia il momento angolare
sia il momento torcente
giacciono sull'asse z
in verso uscente



(e)



(a)



(b)

TABELLA 11.1 Altre corrispondenze fra espressioni relative a moti di traslazione e di rotazione[a]

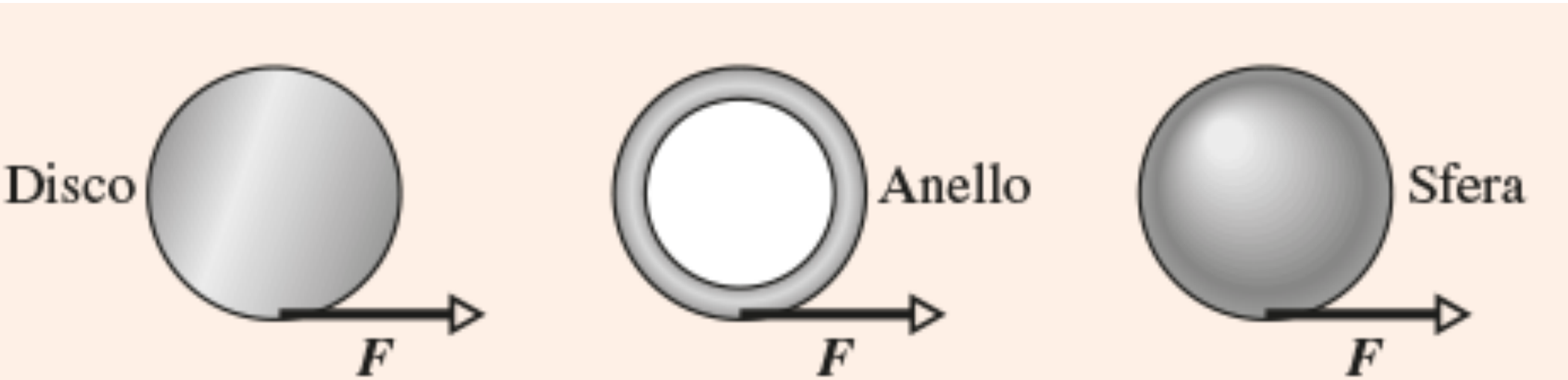
Traslazione		Rotazione	
Forza	$\boldsymbol{F}$	Momento della forza	$\boldsymbol{\tau}\ (=\boldsymbol{r}\times\boldsymbol{F})$
Quantità di moto	$\boldsymbol{p}$	Momento angolare	$\boldsymbol{\ell}\ (=\boldsymbol{r}\times\boldsymbol{p})$
Quantità di moto[b]	$\boldsymbol{P}\ (=\sum \boldsymbol{p}_i)$	Momento angolare[b]	$\boldsymbol{L}\ (=\sum \boldsymbol{\ell}_i)$
Quantità di moto[b]	$\boldsymbol{P} = M\boldsymbol{v}_{\text{cdm}}$	Momento angolare[c]	$L = I\omega$
Seconda legge di Newton[b]	$\boldsymbol{F}_{\text{net}} = \dfrac{d\boldsymbol{P}}{dt}$	Seconda legge di Newton[b]	$\boldsymbol{\tau}_{\text{net}} = \dfrac{d\boldsymbol{L}}{dt}$
Legge di conservazione[d]	$\boldsymbol{P} =$ costante	Legge di conservazione[d]	$\boldsymbol{L} =$ costante

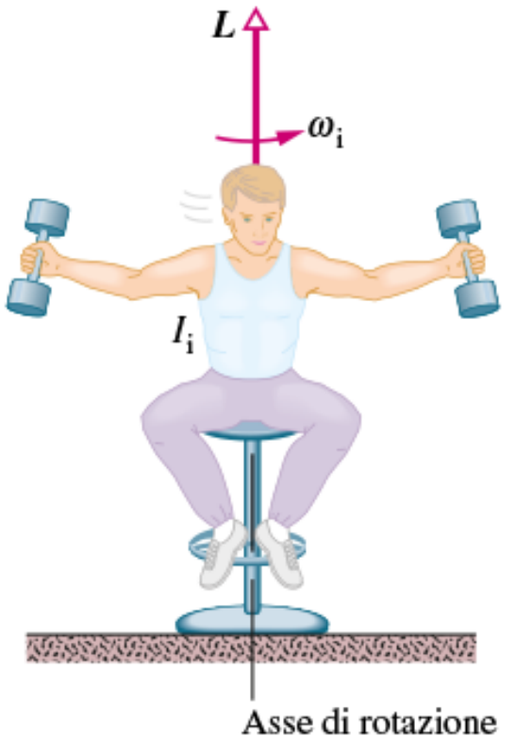
[a] Vedi anche la tabella 10.3.

[b] Per sistemi di particelle, corpi rigidi compresi.

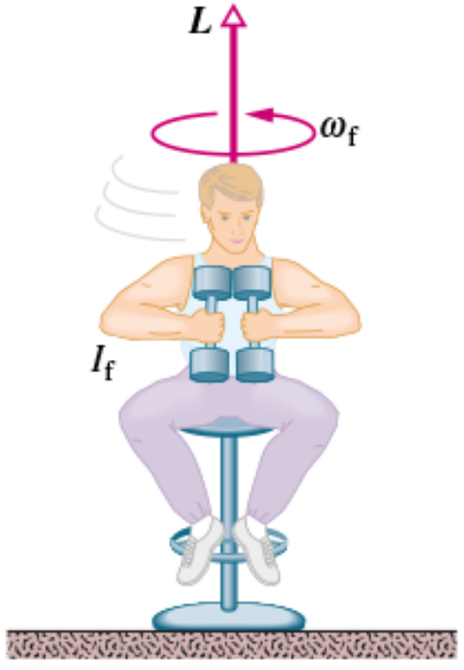
[c] Per un corpo rigido rotante intorno a un asse fisso, essendo L la componente lungo quest'asse.

[d] Per un sistema chiuso e isolato.

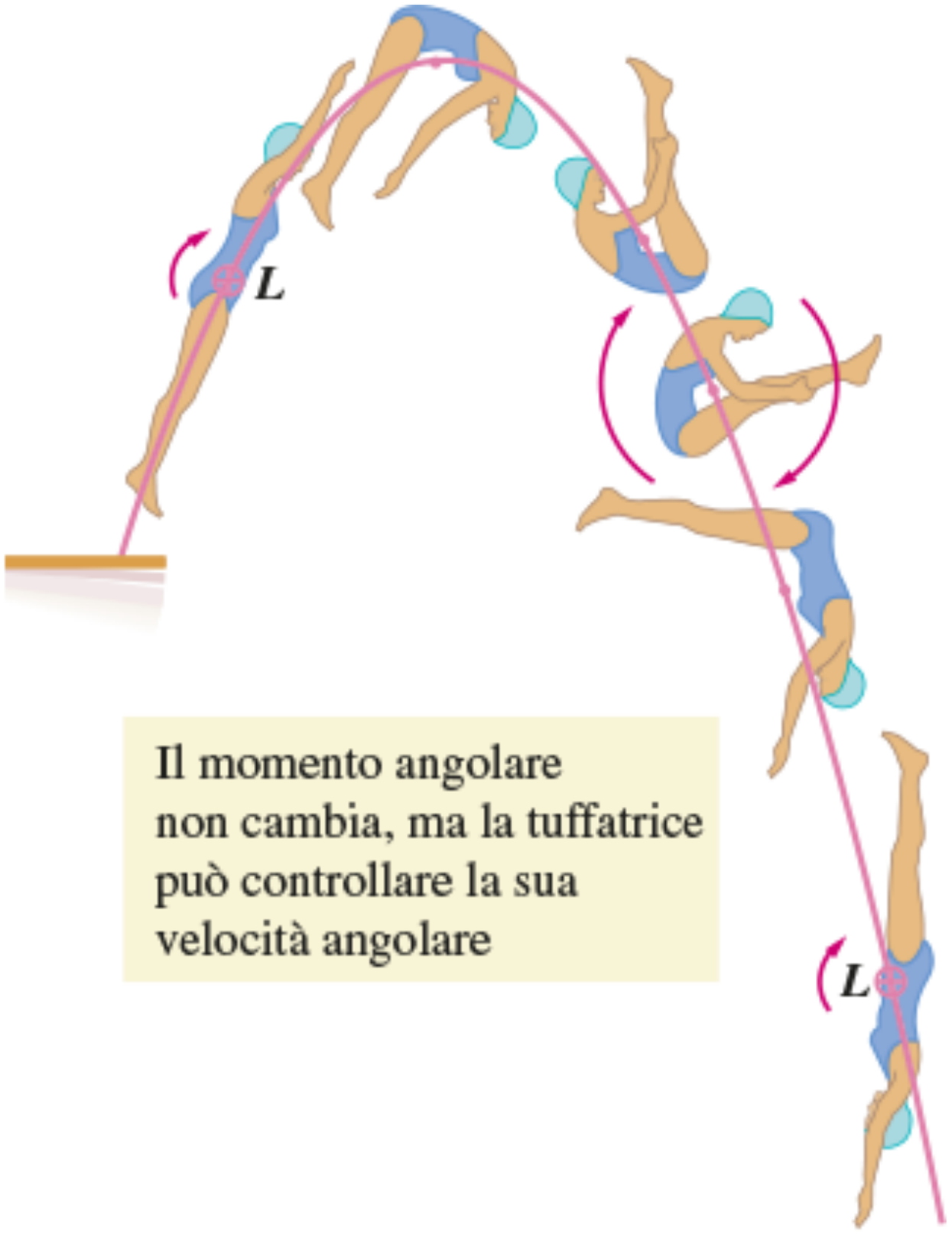




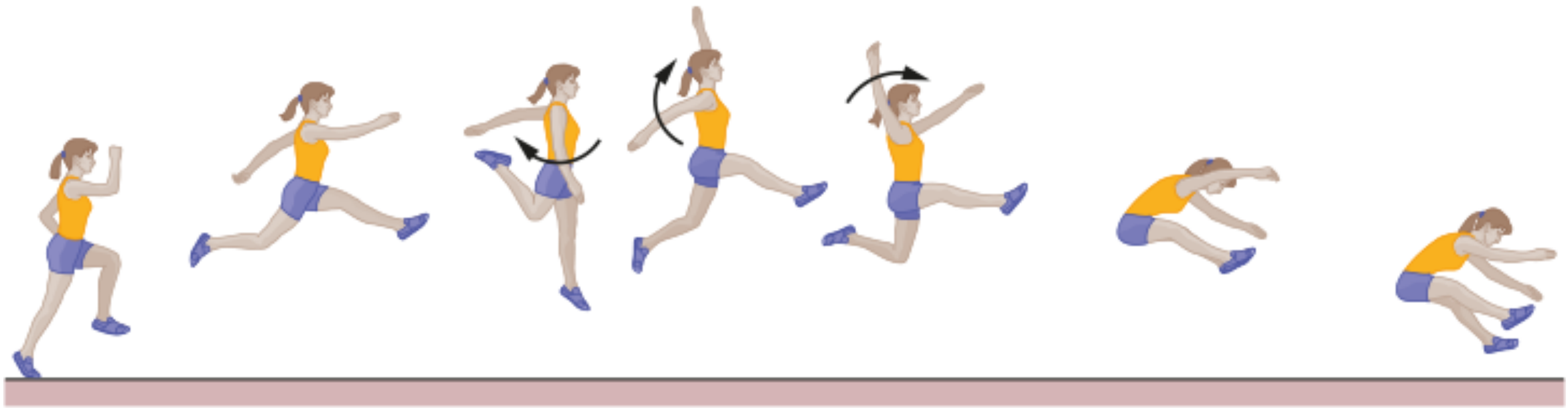
(a)

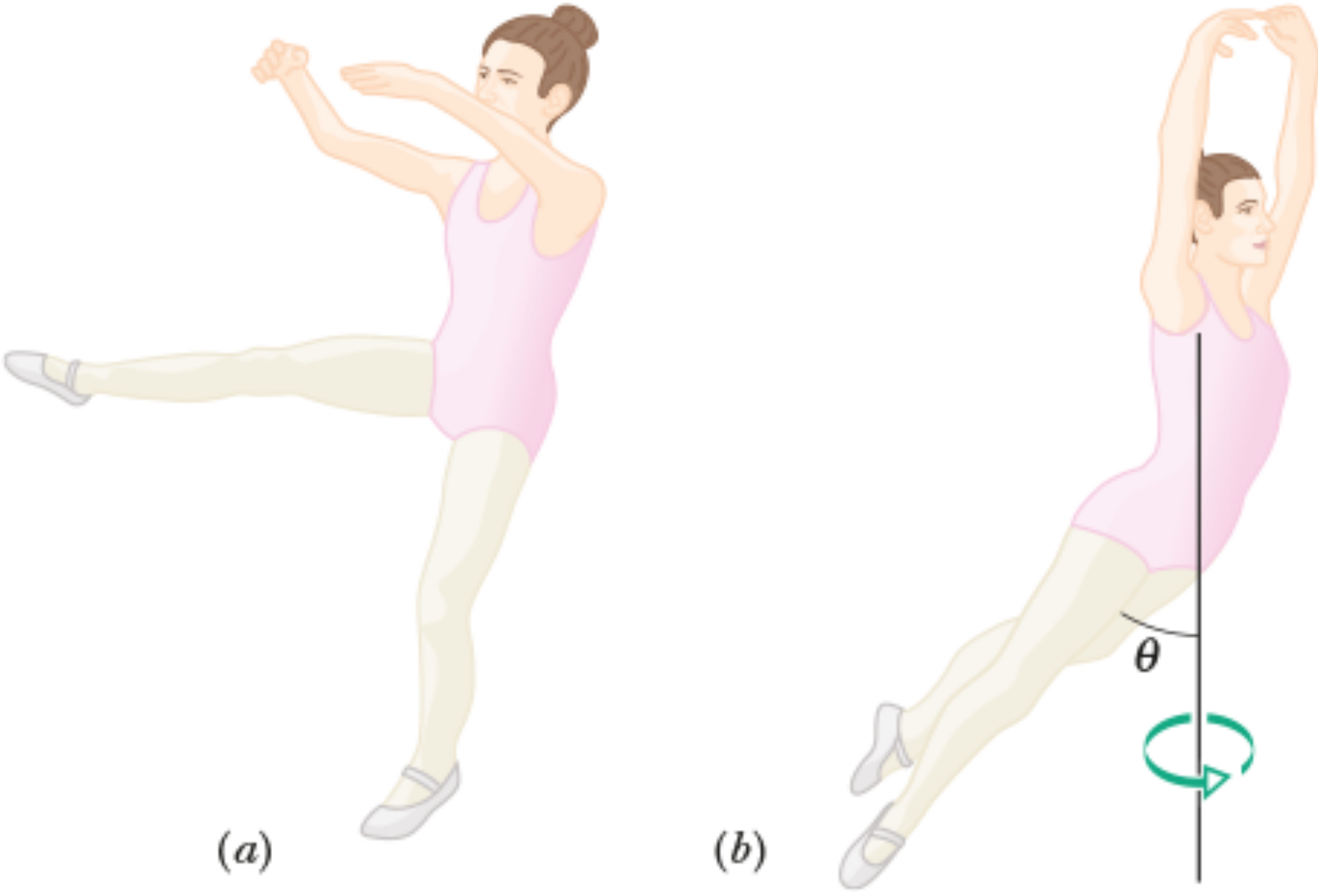


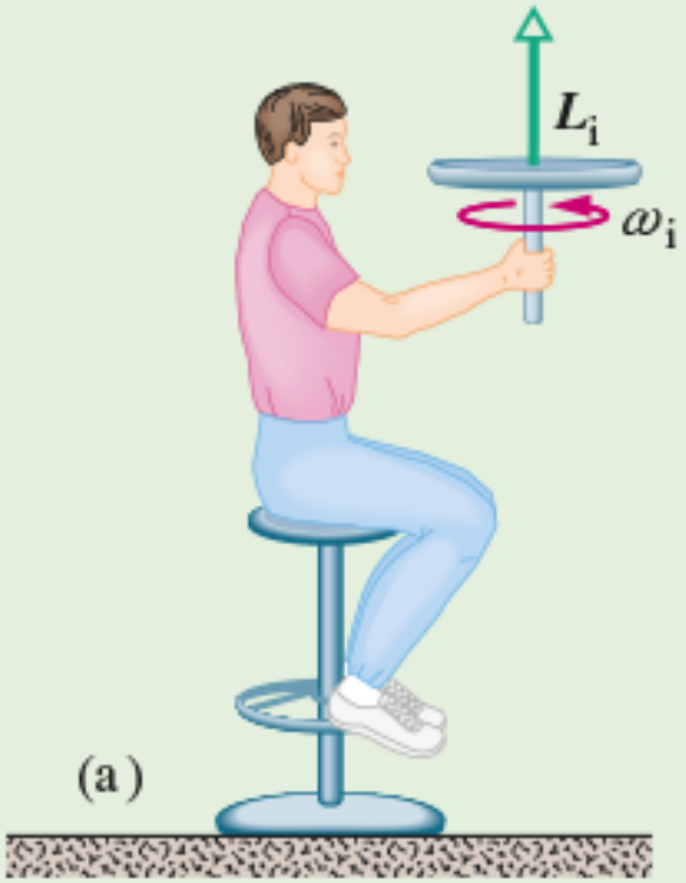
(b)

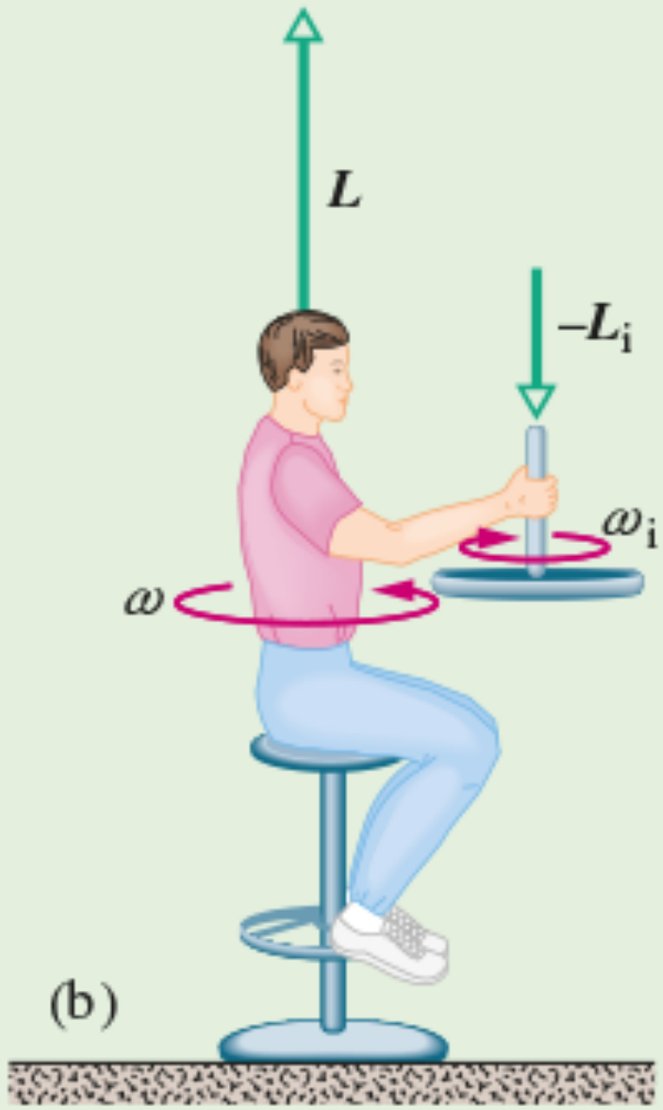


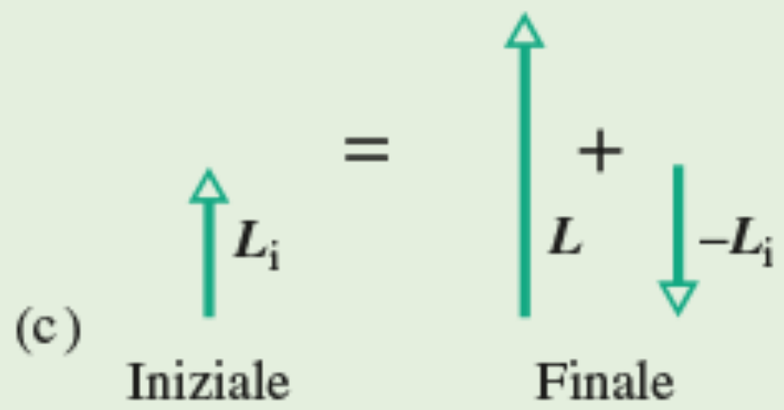
Il momento angolare non cambia, ma la tuffatrice può controllare la sua velocità angolare



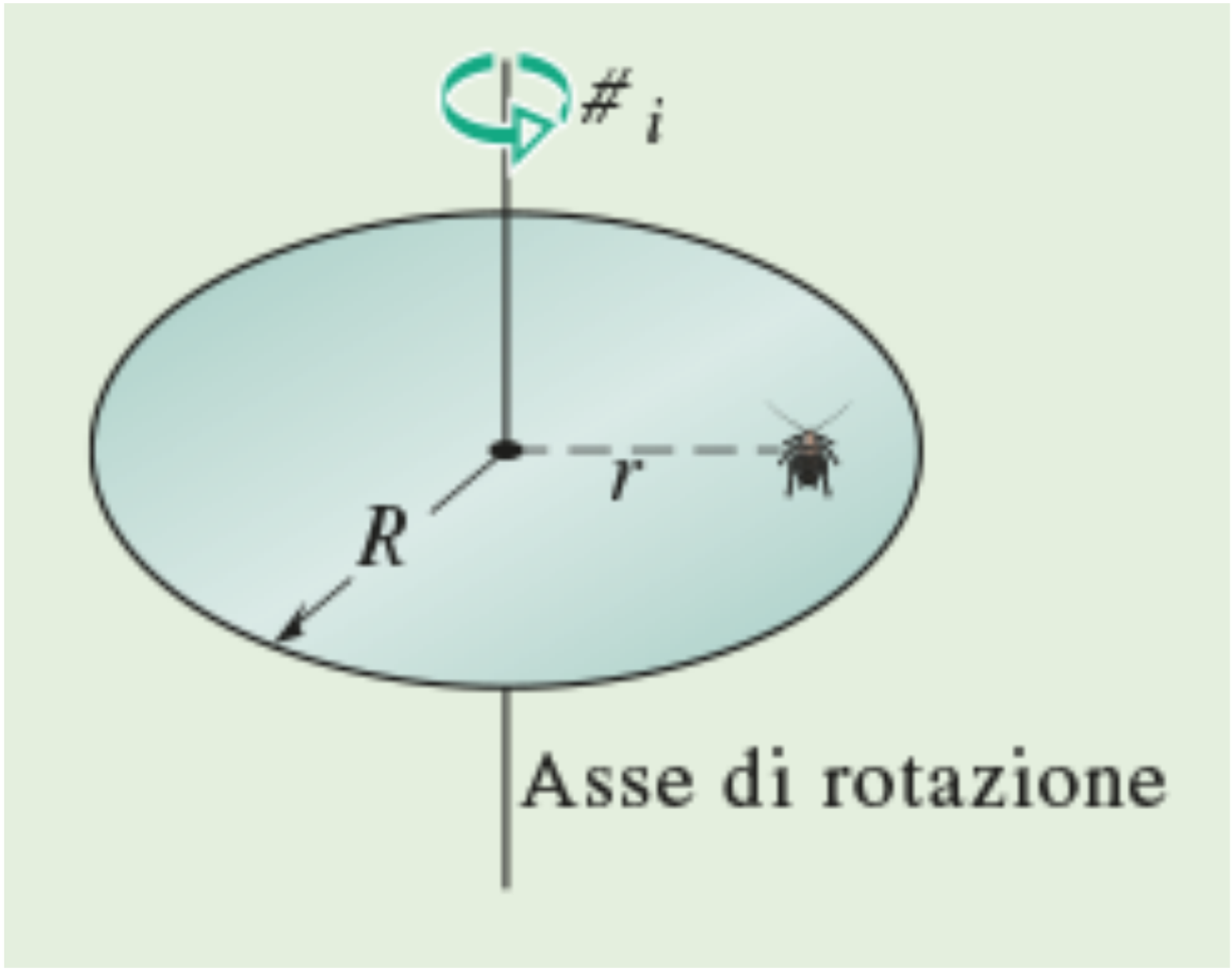


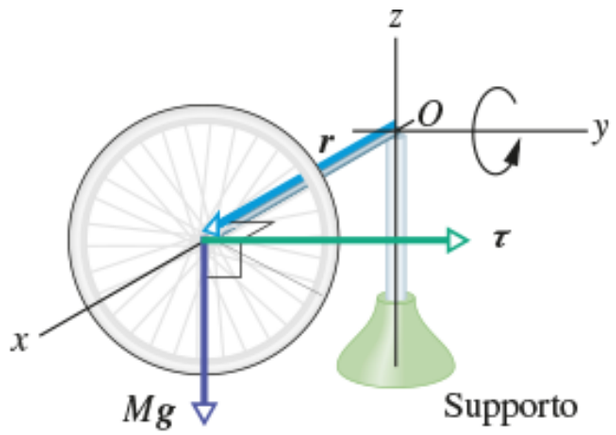




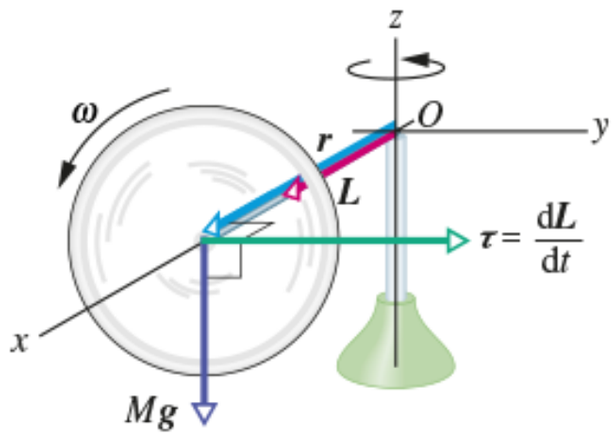


Il momento angolare dello studente non è più nullo e la somma di questi due vettori eguaglia quello iniziale

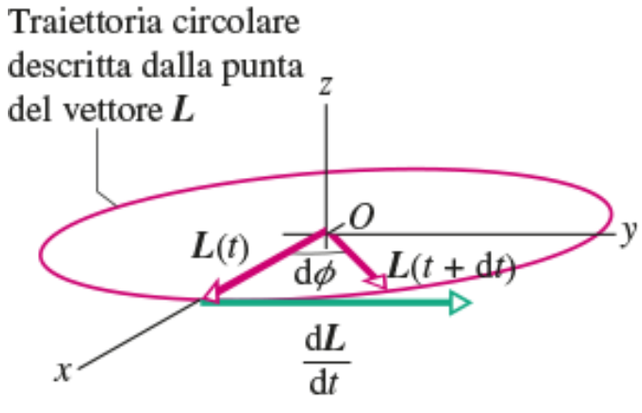




(a)



(b)



(c)