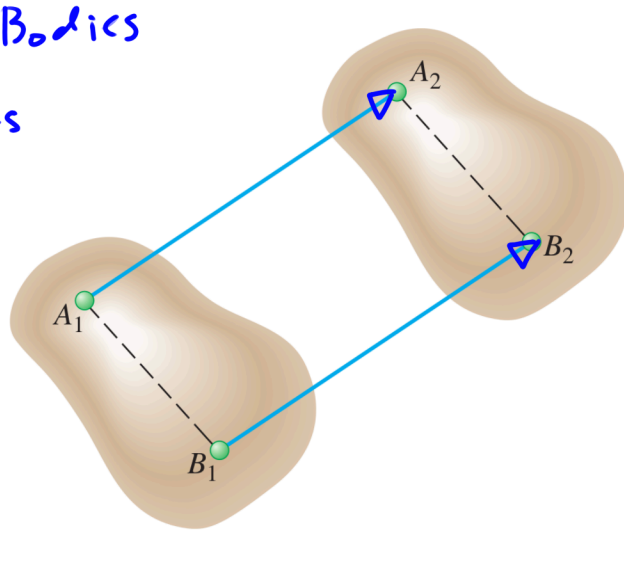
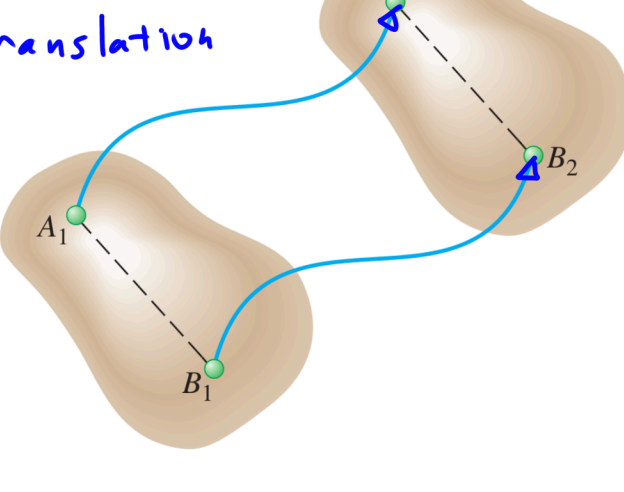


Rigid Bodies Kinematics

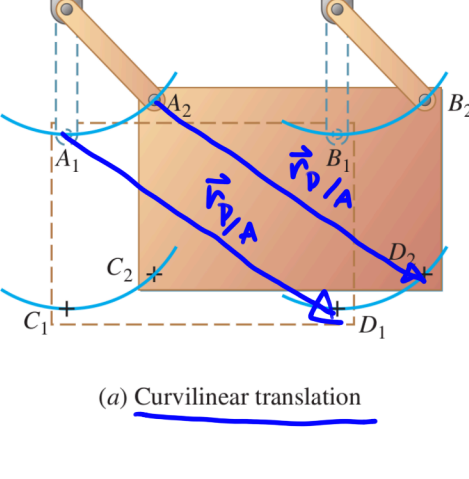
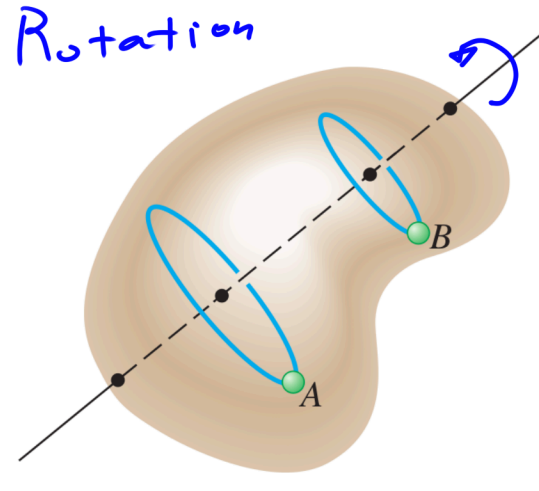


Rectilinear Translation

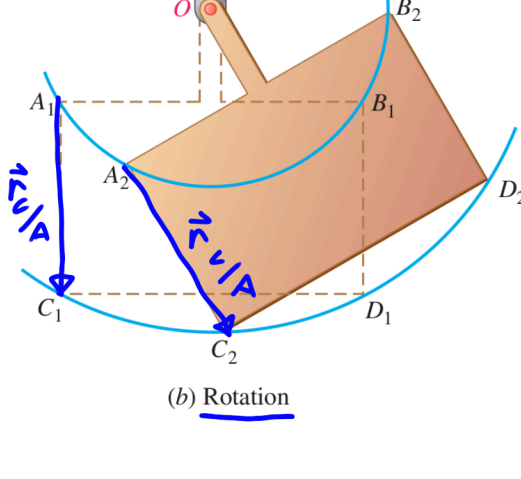
Curvilinear Translation



Rotation



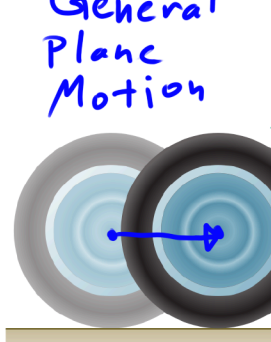
(a) Curvilinear translation



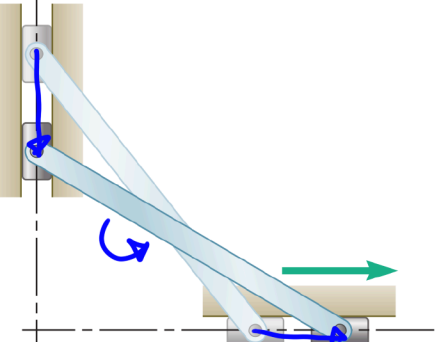
(b) Rotation

General Motion 3D

General Plane Motion

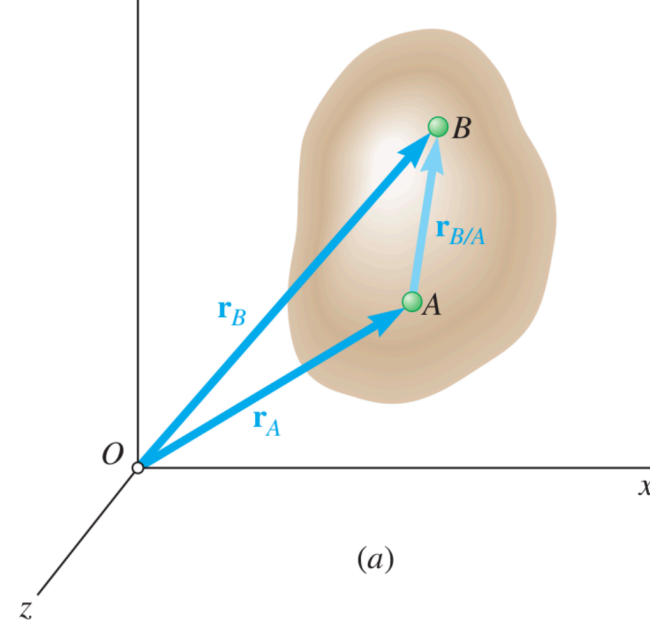


(a) Rolling wheel



(b) Sliding rod

Translation



(a)

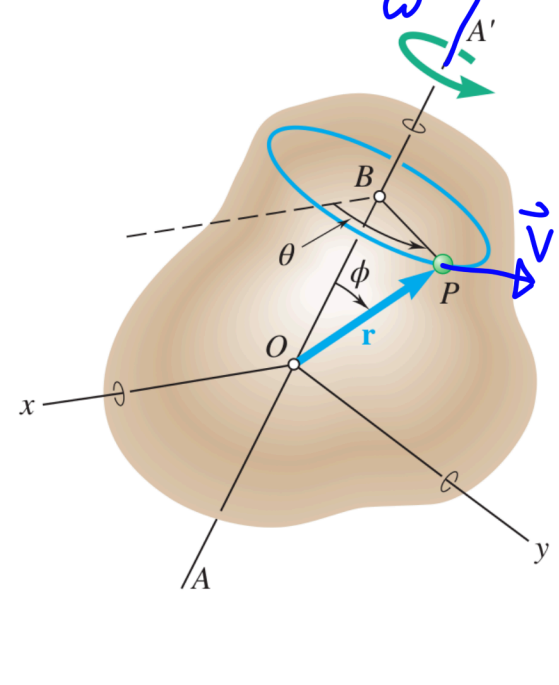
$$\vec{r}_B = \vec{r}_A + \vec{r}_{B/A}$$

$$\vec{r}_{B/A} \text{ constant}$$

$$\vec{V}_B = \frac{d\vec{r}_B}{dt} = \vec{V}_A$$

$$\vec{a}_B = \vec{a}_A$$

Fixed axis notation



$$\vec{v} = \vec{\omega} \times \vec{r}$$

$$\vec{a} = \vec{\alpha} \times \vec{r} + \vec{\omega} \times (\vec{\omega} \times \vec{r})$$

$\vec{\alpha}$ angular acceleration
 \vec{a} linear acceleration
 $\vec{\omega}$ notational velocity
 \vec{v} linear velocity

$$\omega = \frac{d\theta}{dt}$$

$$\alpha = \frac{d\omega}{dt} = \frac{d^2\theta}{dt^2} = \omega \frac{d\omega}{d\theta}$$