

Midterm 1 → Mar 5, Thu, 7-9pm

CARE	Mon Mar 2	8-10pm	429 Grainger
	Wed Mar 4	9-11pm	429 Grainger

Conflict form → by Fri Feb 27

room assignments

1 page of notes - handwritten, 2 sides
closed to electronics & calculating devices.

practice exam on PL → HW1 - HW4

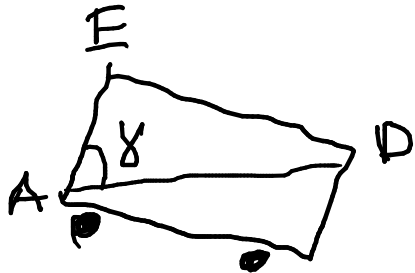
everything before today
in lecture
before RBS.

25 MC.

Rigid Body

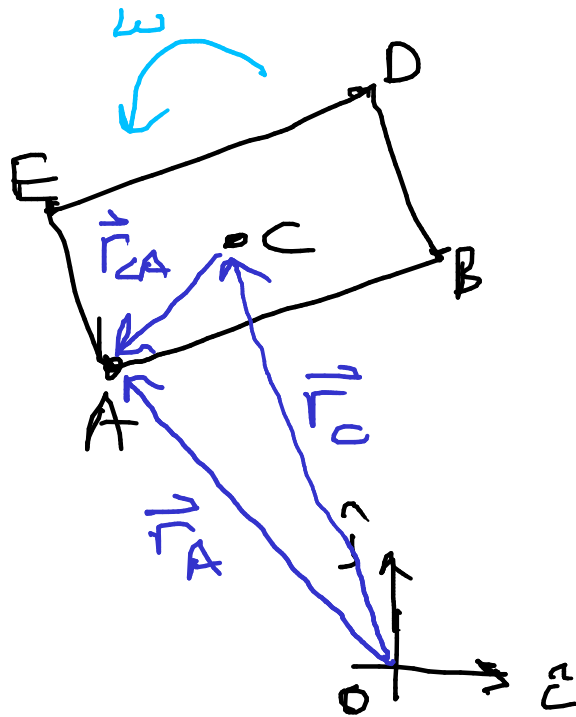


defn
RB has constant distances
between any two points
on the body.
(also angles)



$$\gamma = \angle EAD$$

- Configuration of a RB is characterized by
1 location and one rotation.
- motion of a RB has 1 velocity and 1 ang. vel.



$\vec{r}_{CA}$ = vector from C to A
 $= \vec{CA}$

$r_{CA} = \text{constant}$

$\vec{r}_{CA} \cdot \vec{r}_{CB} = \text{constant}$

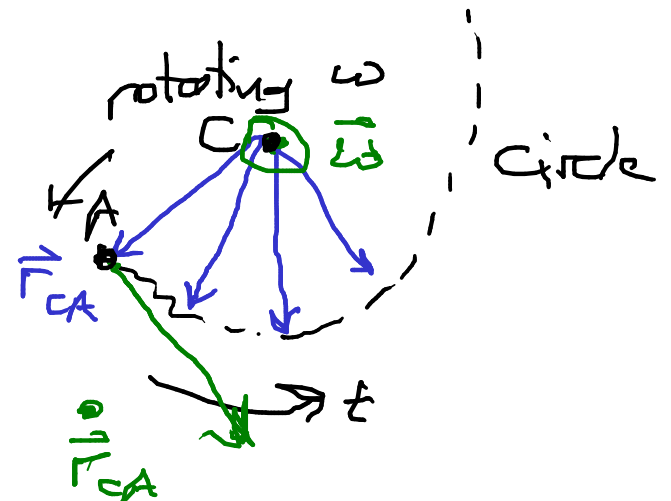
$$\vec{r}_A = \vec{r}_C + \vec{r}_{CA}$$

$$\vec{v}_A = \vec{v}_C + \vec{v}_{CA}$$

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

$= \omega r_{CA}$ orth to circle

$$\vec{r}_{CA} = \vec{r}_A - \vec{r}_C$$



inertial
velocity of A

$$\vec{v}_A = \vec{v}_C + \underbrace{\vec{\omega} \times \vec{r}_{CA}}_{\text{velocity of A rel. to C around C}}$$

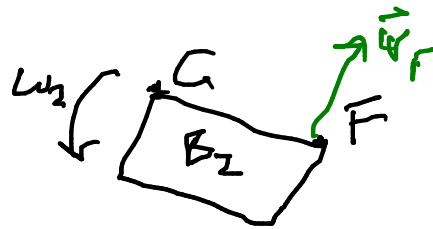
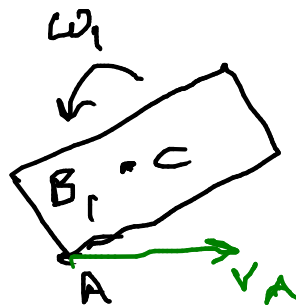
velocity of A rel. to C
around C

$$\vec{a}_A = \vec{a}_C + \dot{\vec{\omega}} \times \vec{r}_{CA} + \vec{\omega} \times \dot{\vec{r}}_{CA}$$

$$\vec{a}_A = \vec{a}_C + \vec{\alpha} \times \vec{r}_{CA} + \vec{\omega} \times (\vec{\omega} \times \vec{r}_{CA})$$

$\vec{r}_C, \vec{v}_C, \vec{a}_C \rightarrow$ point C movement

$\vec{\omega}, \vec{\alpha} \rightarrow$ body rotation



$$\vec{v}_A = \vec{v}_C + \vec{\omega} \times \vec{r}_{CA}$$

$$\vec{v}_B = \vec{v}_A + \vec{\omega} \times \vec{r}_{AB}$$

Which dir is $\vec{v}_B$?

