2nd chance exams.

$\longrightarrow$ sign up until 1 h before timeslots.

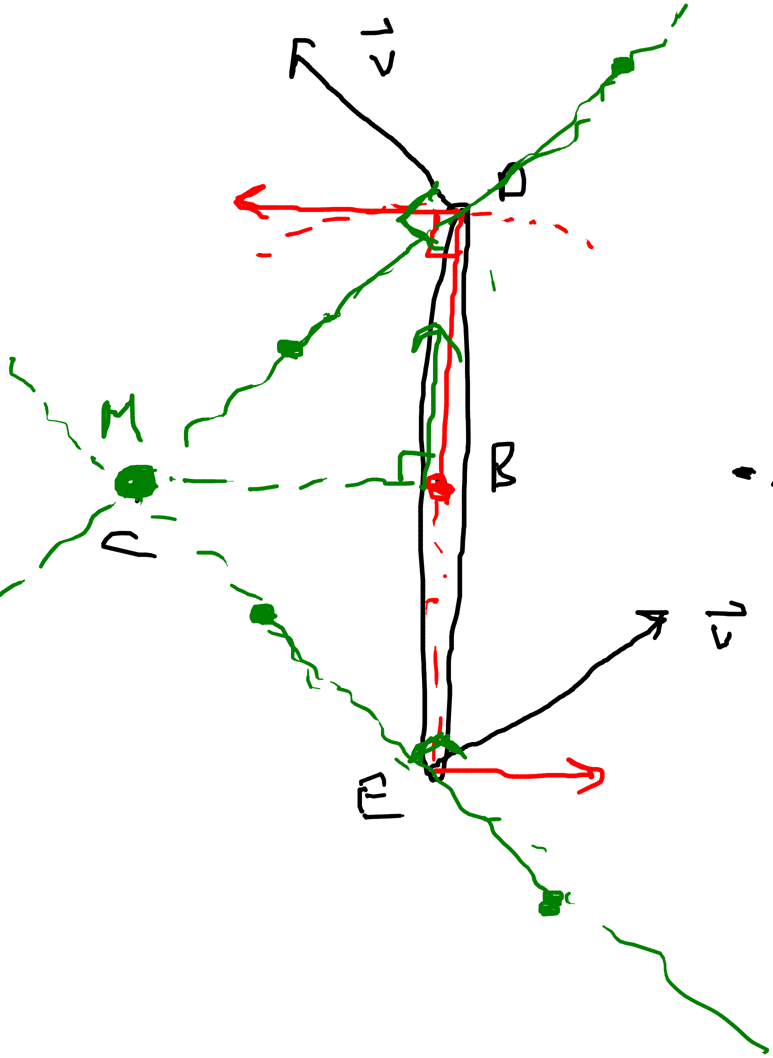
HW 6 delayed by 1 week.

Instantaneous Centers

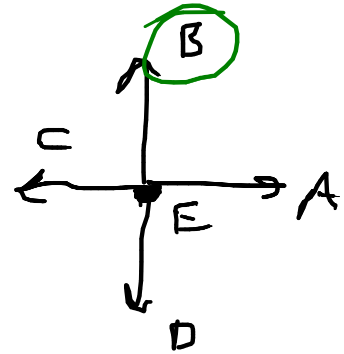
- RB moving in 2D, $\omega \neq 0$, then there will be one point that is stationary

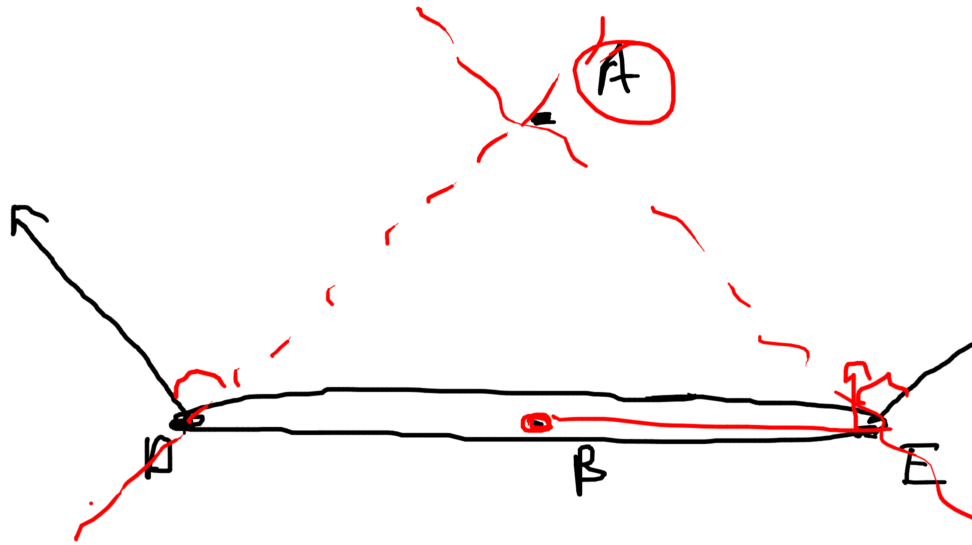
  $\Longrightarrow$ IC M

- RB is rotating about M.



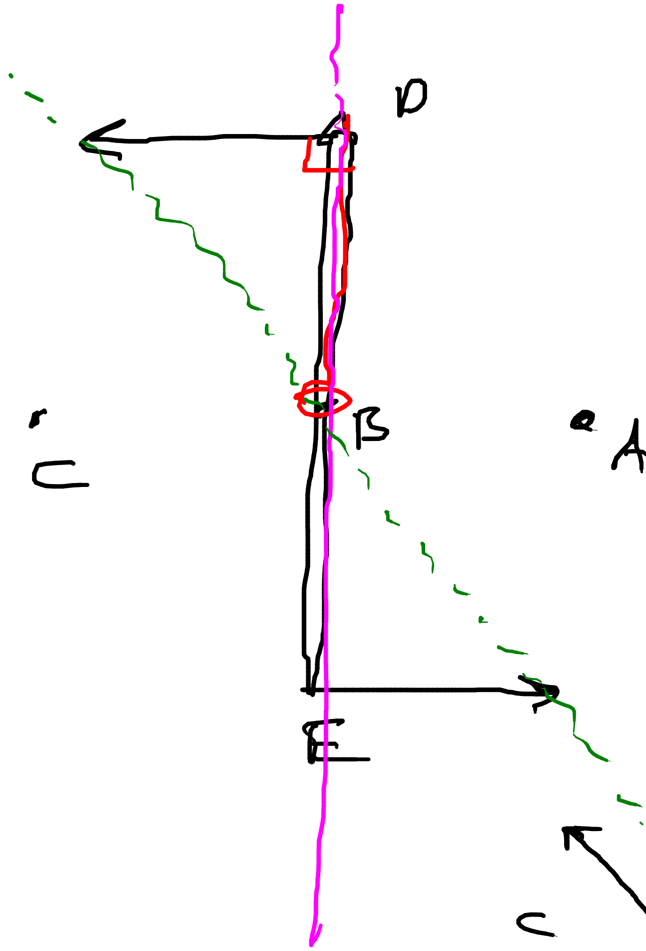
$\hat{v}_B$



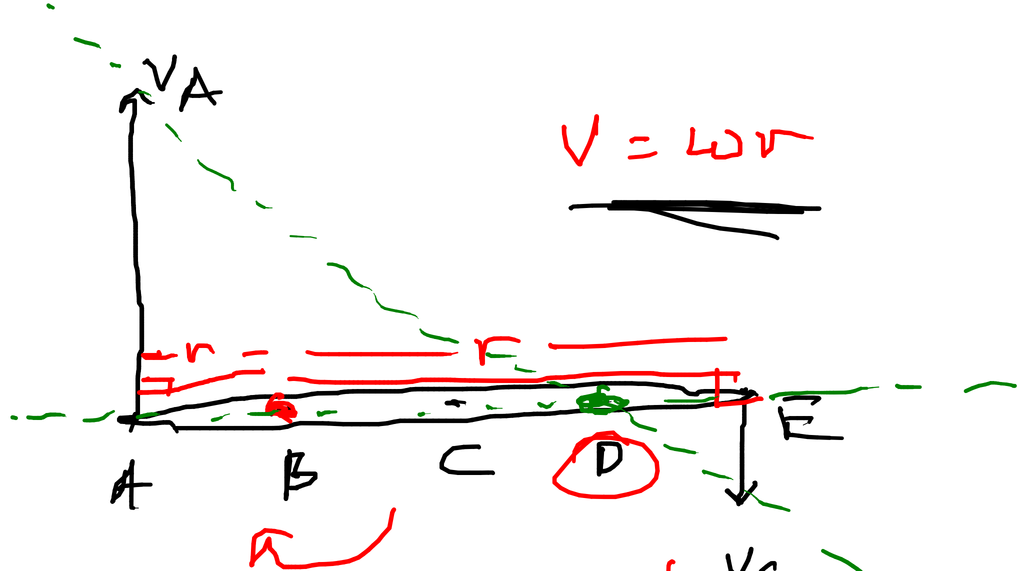


Impossible for RB.

C

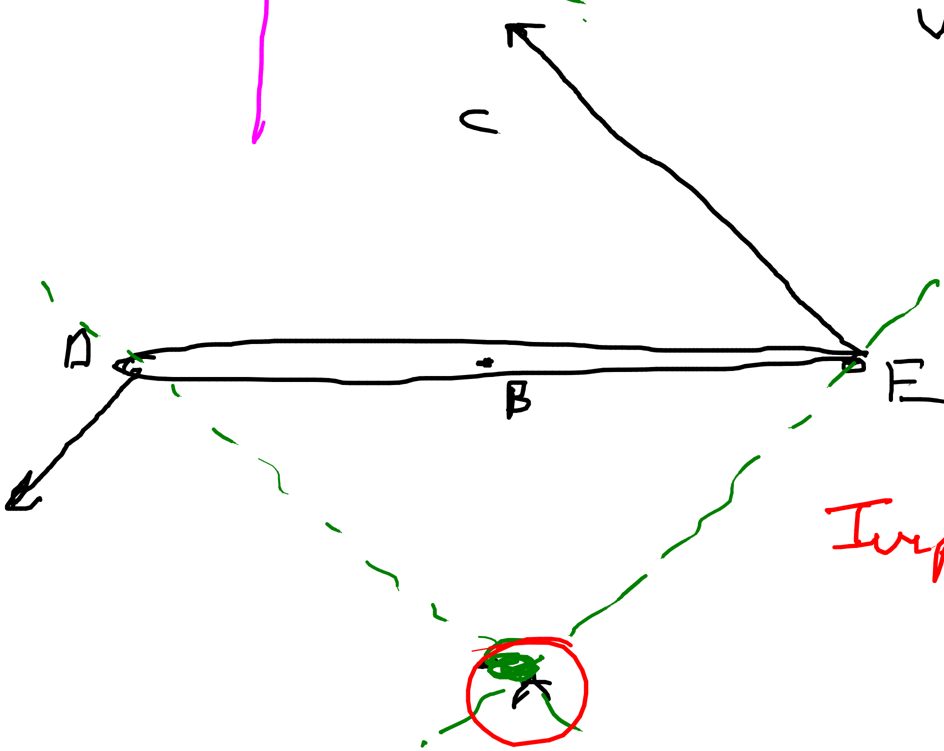


$V = \omega r$

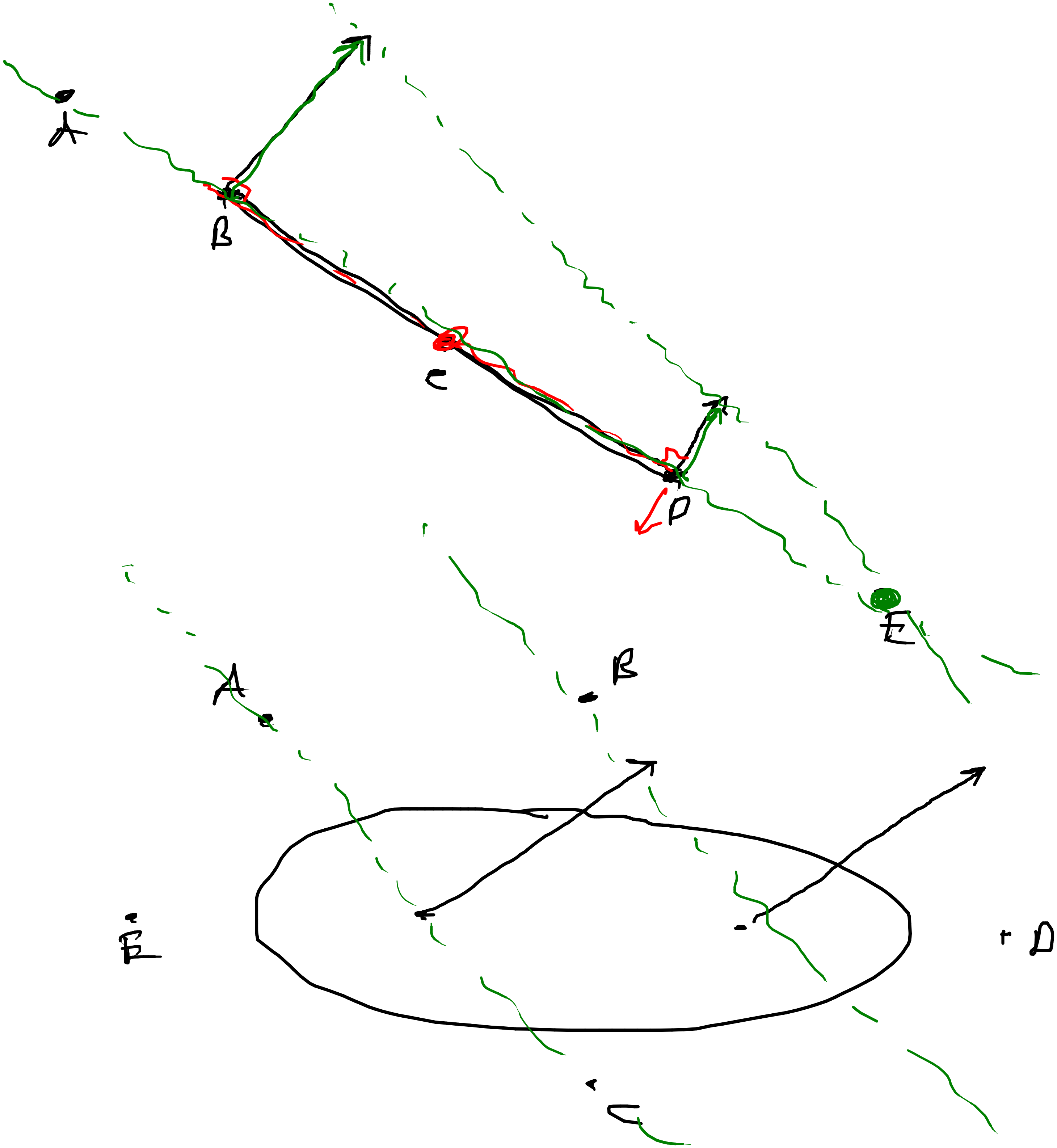


$\frac{\omega \quad 3}{r_A} \quad \frac{1}{r_E}$

$\frac{V_A}{V_E} =$ A. 2
B. 3
C. 4
D. 5
E. 6



Impossible for RB.



no rotation

no IC

Graphical procedure

1 draw perpendiculars to $\vec{v}$

intersect $\Rightarrow$ M

If fails $\Rightarrow$ 2 draw through $\vec{v}$ tips

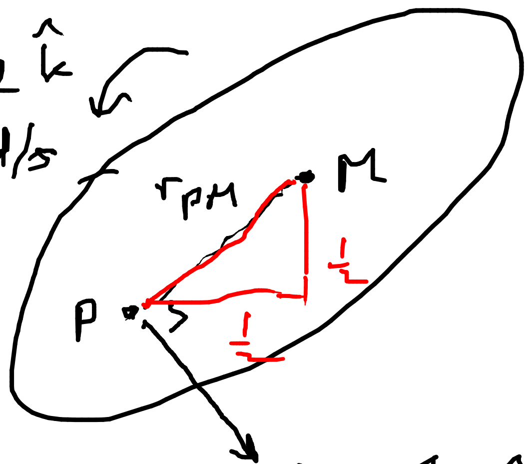
intersects $\Rightarrow$ M

Careful : – consistent dir of rotation

– consistent mag of v $(v = \omega r)$

Equatbus

$\vec{\omega} = 2\hat{k}$ rad/s



$\vec{V} = \hat{i} - \hat{j}$ m/s

$\vec{r}_{PM} = \_\_\_\_\ \hat{i} + \_\_\_\_\ \hat{j}$ m

A. $\sqrt{2}$

B. 2

C. 1

D. $\frac{1}{\sqrt{2}}$

E. $\frac{1}{2}$

M?

$\vec{r}_{PM}$?

$v_p = \omega r_{PM}$ scalars *

$0 = \vec{V}_M = \underline{\vec{V}_p} + \underline{\omega_z}\ \vec{r}_{PM}^{\perp}$?

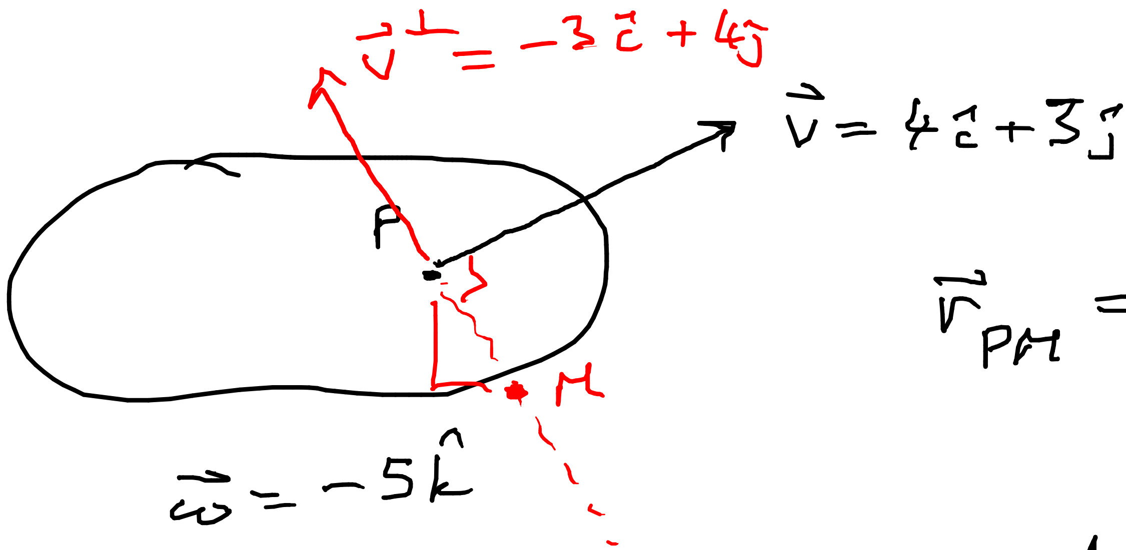
$-\vec{r}_{PM} = \vec{r}_{PM}^{\perp\perp} = -\frac{1}{\omega_z} \vec{V}_p^{\perp}$

$$\boxed{\vec{r}_{PM} = \frac{1}{\omega_z} \vec{V}_p^{\perp}}$$

$\frac{1}{2}(\hat{i} + \hat{j})$

$$\boxed{\vec{r}_{PM} = \frac{1}{\omega^2} \vec{\omega} \times \vec{V}_p}$$

$\frac{1}{\sqrt{2}}$ $\boxed{r_{PM} = \frac{V_p}{\omega}}$ $\frac{\sqrt{2}}{2}$



$\vec{r}_{PM} = \_\_\_\_ \hat{i} + \_\_\_\_ \hat{j}$

A. 0.8

B. 0.6

C. −0.8

D. −0.6

E. 14

$$\vec{r}_{PM} = \frac{1}{-5}(-3\hat{i} + 4\hat{j})$$

$$= 0.6\hat{i} - 0.8\hat{j}$$

M is not fixed.