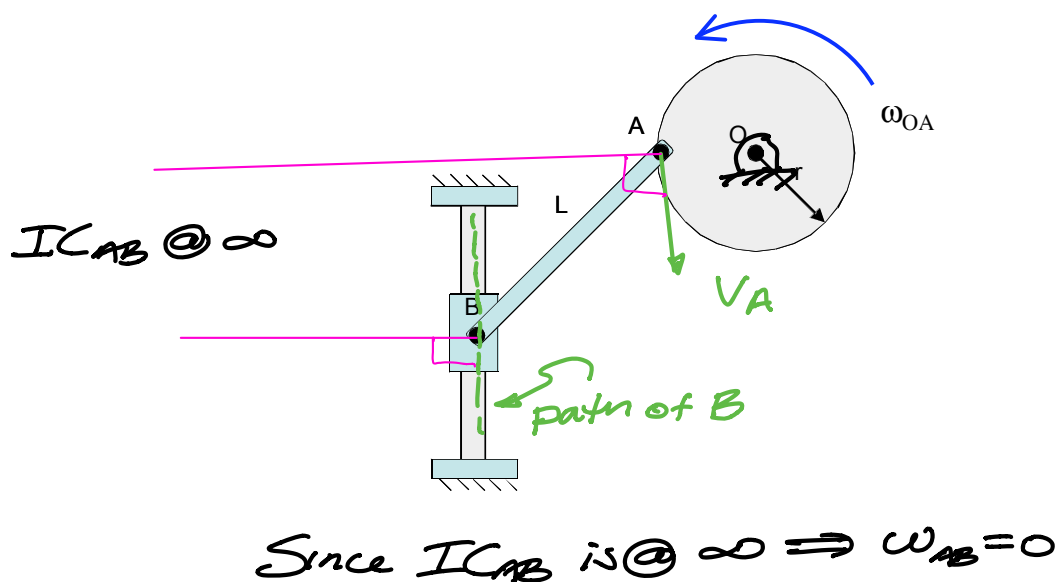


**Question C2.4**

Collar B is free to move vertically, and the rigid disk is free to rotate about point O. Collar B and point A on the disk are connected by a rigid link. At the instant shown, point A on the disk is on the same horizontal line as point O. At this instant, the angular velocity of AB is:

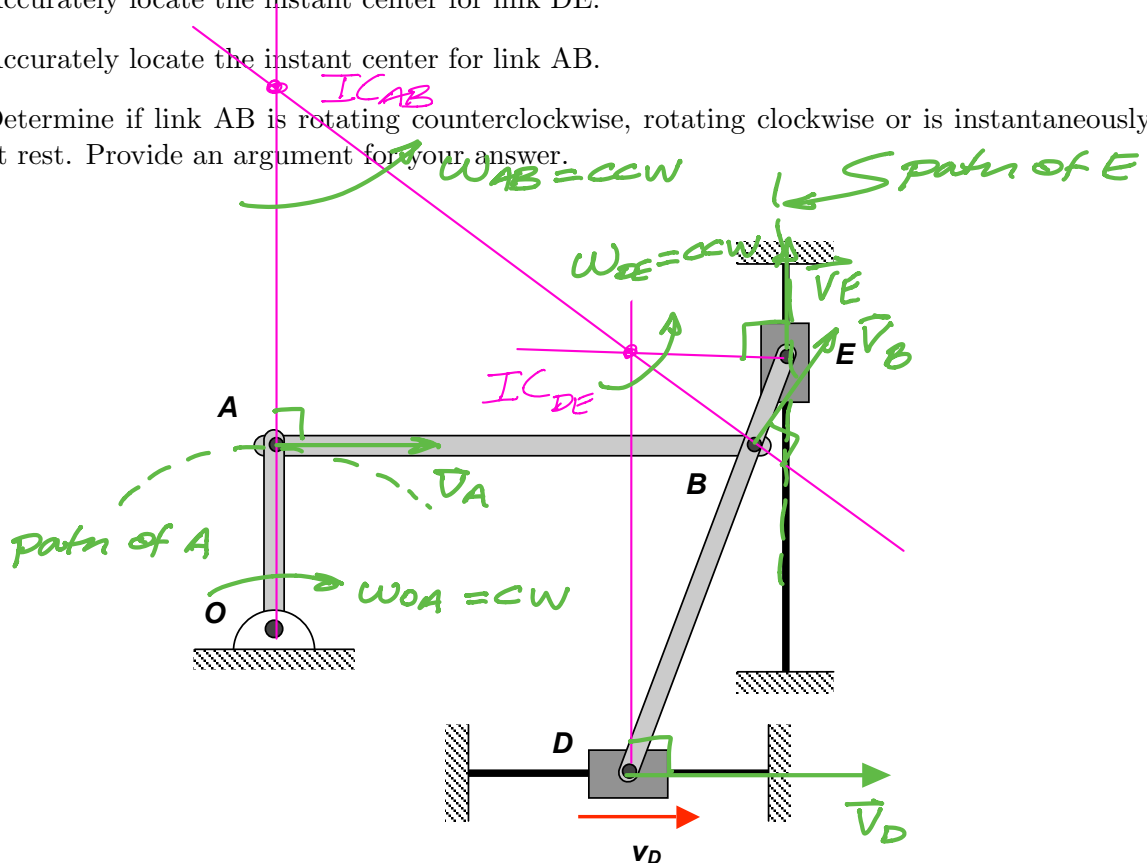
- (a) counterclockwise
- (b) zero
- (c) clockwise
- (d) indeterminate without known values for  $L$ ,  $r$  and  $\omega_{OA}$



### Question C2.5

A mechanism is made up of links OA, AB and DE. Pins D and E on link DE are constrained to move along straight guides. Link OA is pinned to ground at O and pinned to link AB at A. Link AB is also pinned to link DE at point B. Pin D moves to the right with a speed of  $v_D$ . For the position shown:

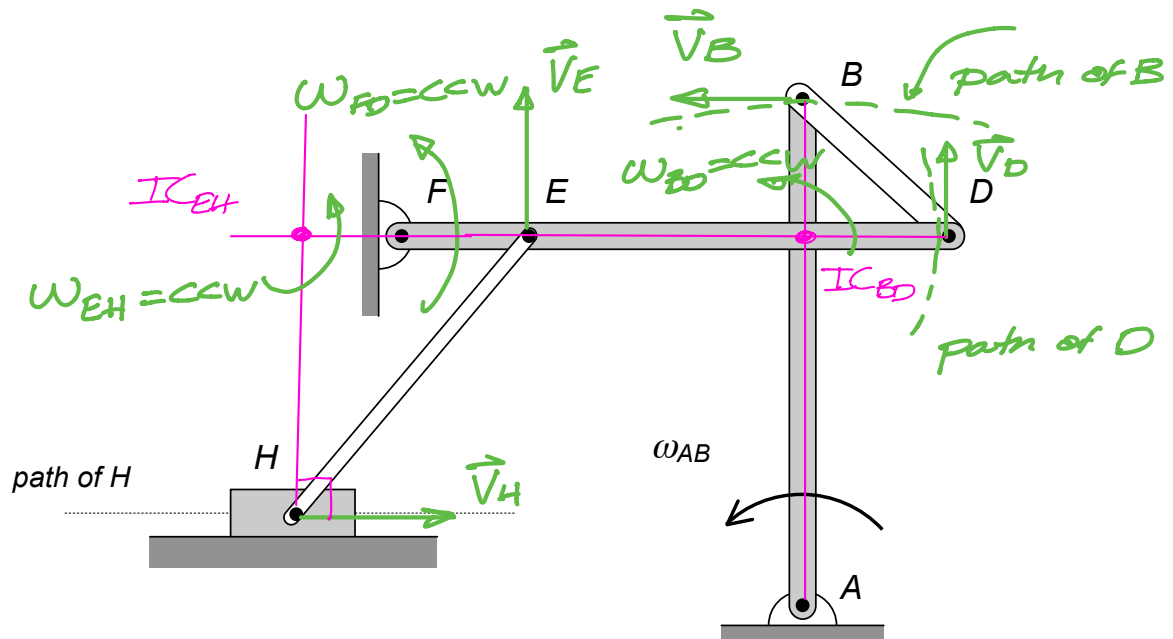
- Accurately locate the instant center for link DE.
- Accurately locate the instant center for link AB.
- Determine if link AB is rotating counterclockwise, rotating clockwise or is instantaneously at rest. Provide an argument for your answer.



**Question C2.6**

The mechanism shown below is made up of links AB, BD, DF and EH. Links AB and DF are pinned to ground at pins A and F, respectively. Link EH is pinned to link DF at E. Pin H is constrained to move along a straight, horizontal path. Link AB is rotating counterclockwise, as shown.

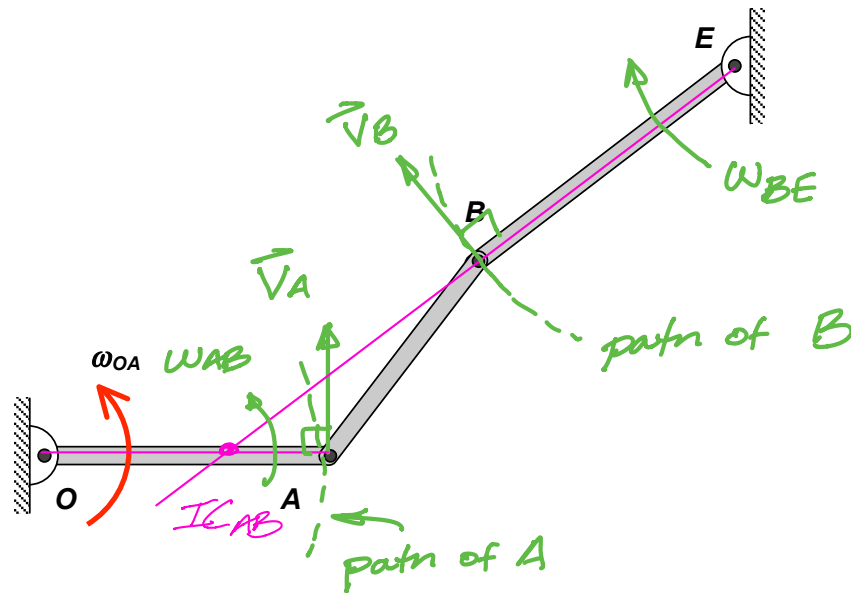
- Accurately locate the instant center for link BD.
- Accurately locate the instant center for link EH.
- What is the direction of motion for pin H (left, right or instantaneously stationary)? Provide an argument for your answer.



### Question C2.7

The mechanism shown below is made up on rigid links OA, AB and BE. Link OA is rotating in the counterclockwise direction with an angular speed of  $\omega_{OA}$ .

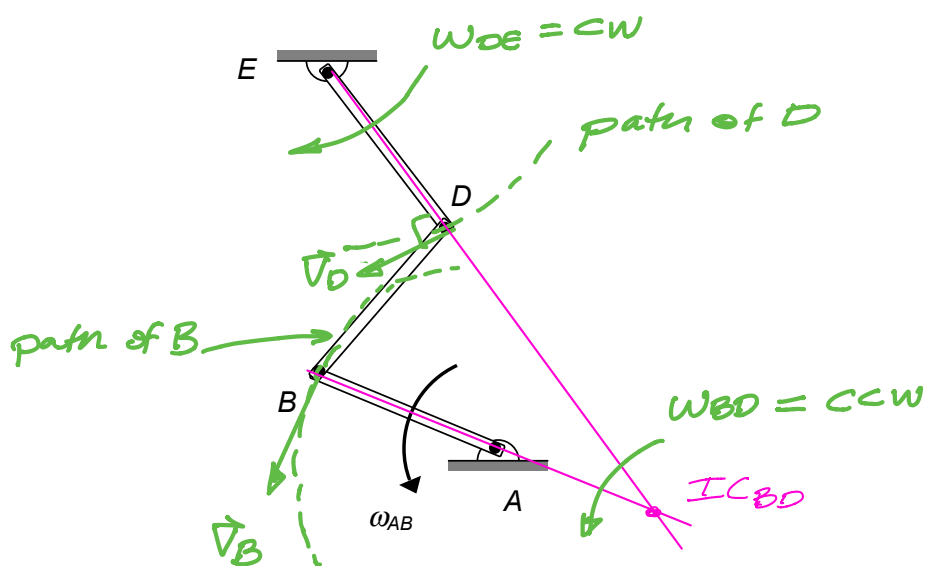
- (a) Accurately locate the instant center for link AB.
- (b) Is AB rotating clockwise, rotating counterclockwise or instantaneously stationary? Justify your answer.
- (c) Is BE rotating clockwise, rotating counterclockwise or instantaneously stationary? Justify your answer.



**Question C2.8**

The mechanism shown below is made up on rigid links AB, BD and DE. Link AB is rotating in the counterclockwise direction with an angular speed of  $\omega_{AB}$ .

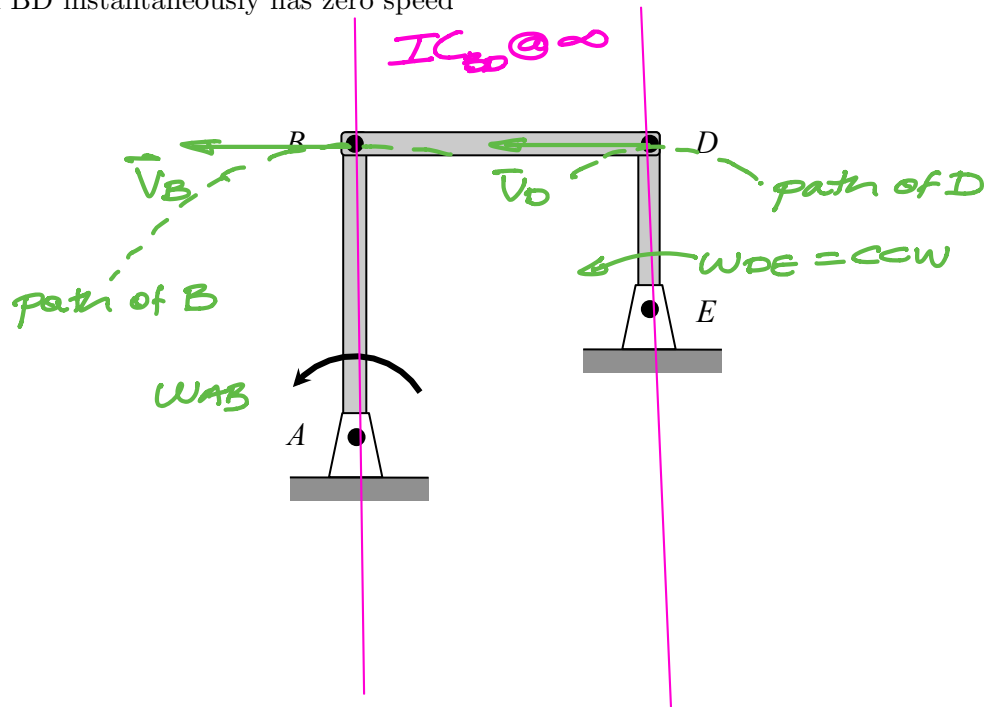
- Accurately locate the instant center for link BD.
- Is BD rotating clockwise, rotating counterclockwise or instantaneously stationary? Justify your answer.
- Is DE rotating clockwise, rotating counterclockwise or instantaneously stationary? Justify your answer.



**Question C2.9**

Link AB of the mechanism shown below is rotating counterclockwise when at the configuration shown (when AB and DE are vertical, and BD is horizontal). At this configuration (circle the correct answer):

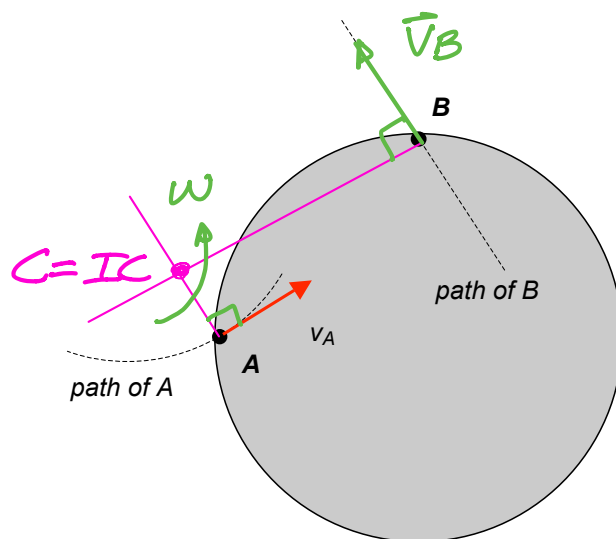
- (a) Link BD is rotating counterclockwise
- (b) Link BD is rotating clockwise
- (c) Link BD instantaneously has zero speed



**Question C2.10**

A scaled drawing of a rigid disk is shown below highlighting two points A and B on the disk. The velocity of A,  $v_A$ , is shown on the disk as well as the path of point B. Circle the response below that most accurately describes the speeds  $v_A$  and  $v_B$ :

- (a)  $v_B = 0$
- (b)  $0 < v_B < v_A$
- (c)  $v_B = v_A > 0$
- (d)  $v_B > v_A > 0$
- (e) Additional information is needed to answer this question.



**Question C2.13**

Ends A and B of a thin bar slide on vertical and horizontal surfaces, respectively. At the position shown,  $\theta < 45^\circ$ . For this position, circle the answer below that most accurately describes the relative sizes of the speeds  $v_A$  and  $v_B$ :

- (a)  $v_A > v_B$
- (b)  $v_A = v_B$
- (c)  $v_A < v_B$
- (d) Additional information is needed to answer this question.

