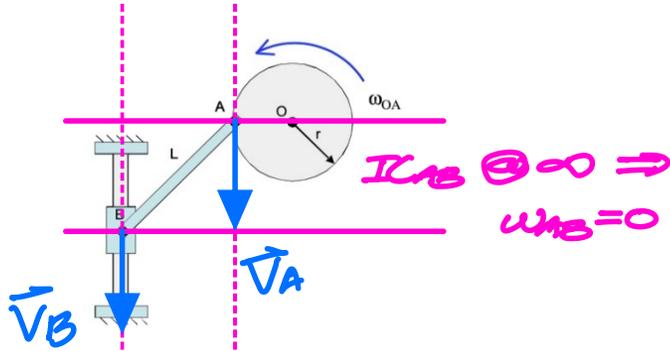


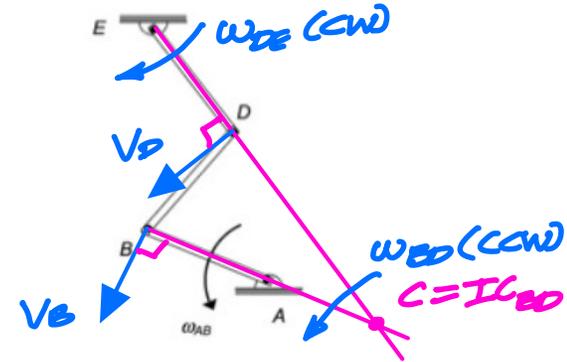
Collar B is free to move vertically, and the rigid disk is free to rotate about point O. Collar B and point A on the disk are connected by a rigid link. At the instant shown, point A on the disk is on the same horizontal line as point O. At this instant, the angular velocity of AB is:

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



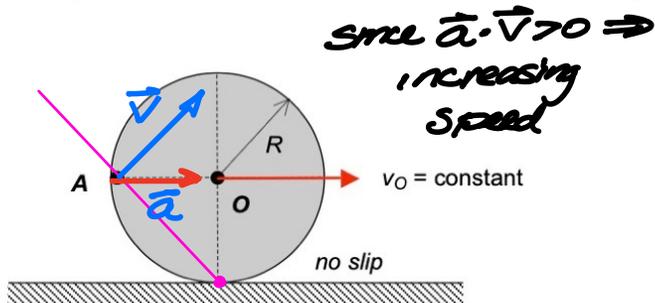
The mechanism shown below is made up of rigid links AB, BD and DE. Link AB is rotating in the counterclockwise direction with an angular speed of ω_{AB} .

- a) Is link BD rotating clockwise, **counterclockwise** or instantaneously not rotating?
- b) Is link DE rotating **clockwise**, counterclockwise or instantaneously not rotating?



A wheel rolls without slipping as its center O moves to the right with a constant speed of v_O . Point A is on the circumference of the wheel. At the instant shown, A is located directly to the left of O. At this instant (circle the correct answer):

- (a) The speed of A is decreasing.
- (b) The speed of A is constant.
- (c) The speed of A is increasing.**
- (d) Numerical values for v_O and the radius R of the wheel are needed to answer this question.



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 angular speed.**

