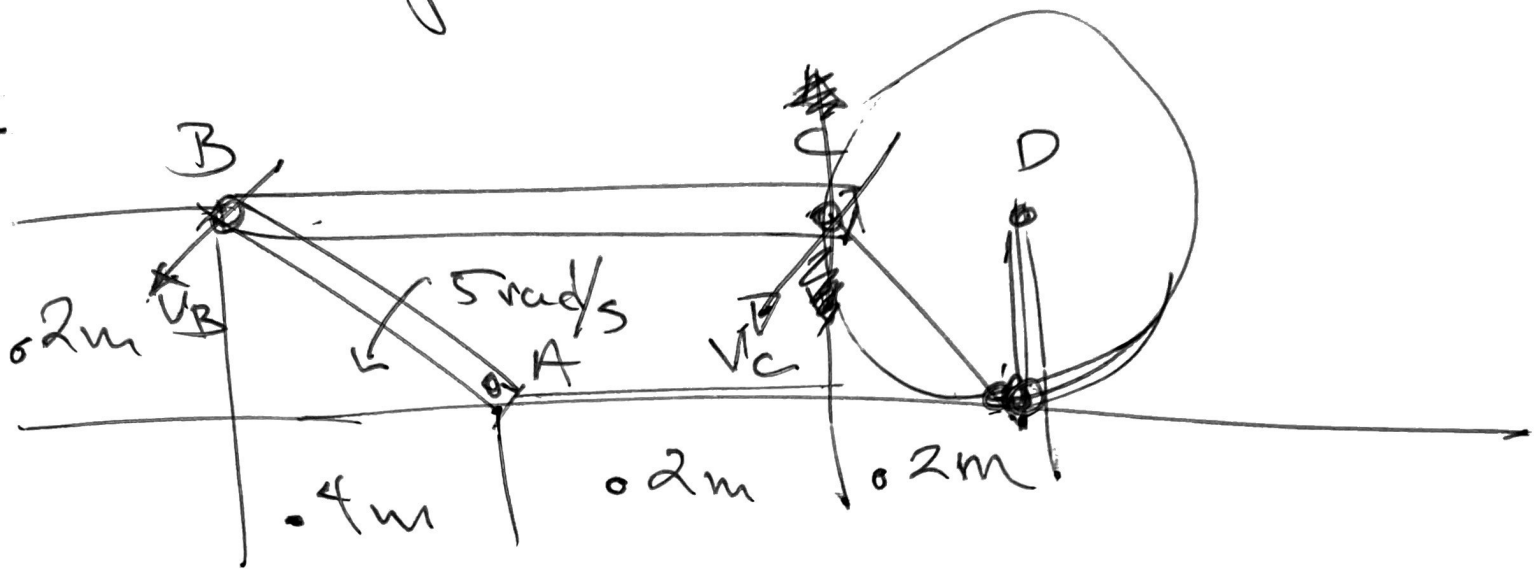
Given:



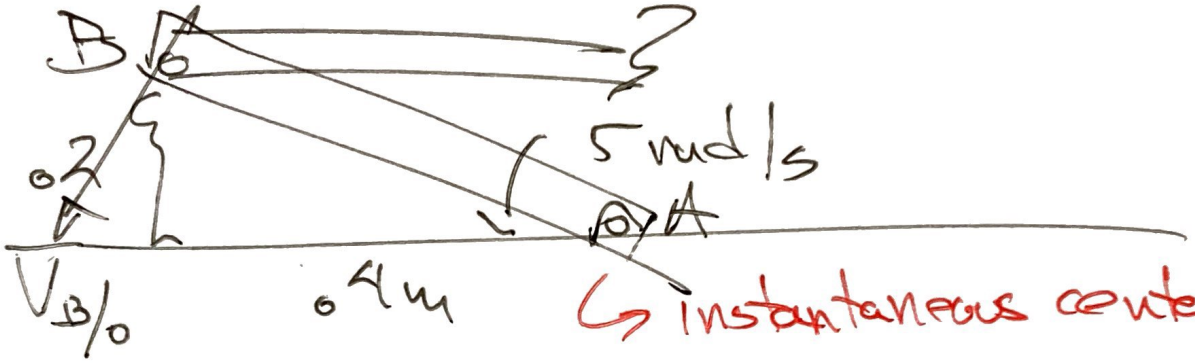
Req'd ω_{BC}

Assump: I don't know nuthin'!

Strategy Lot of instantaneous centers & math!

Estimate I have a very fuzzy sense that because AB > CD that the arm BC is rotating maybe about 1/2 as much so 2.5 rad/s??

Soln:



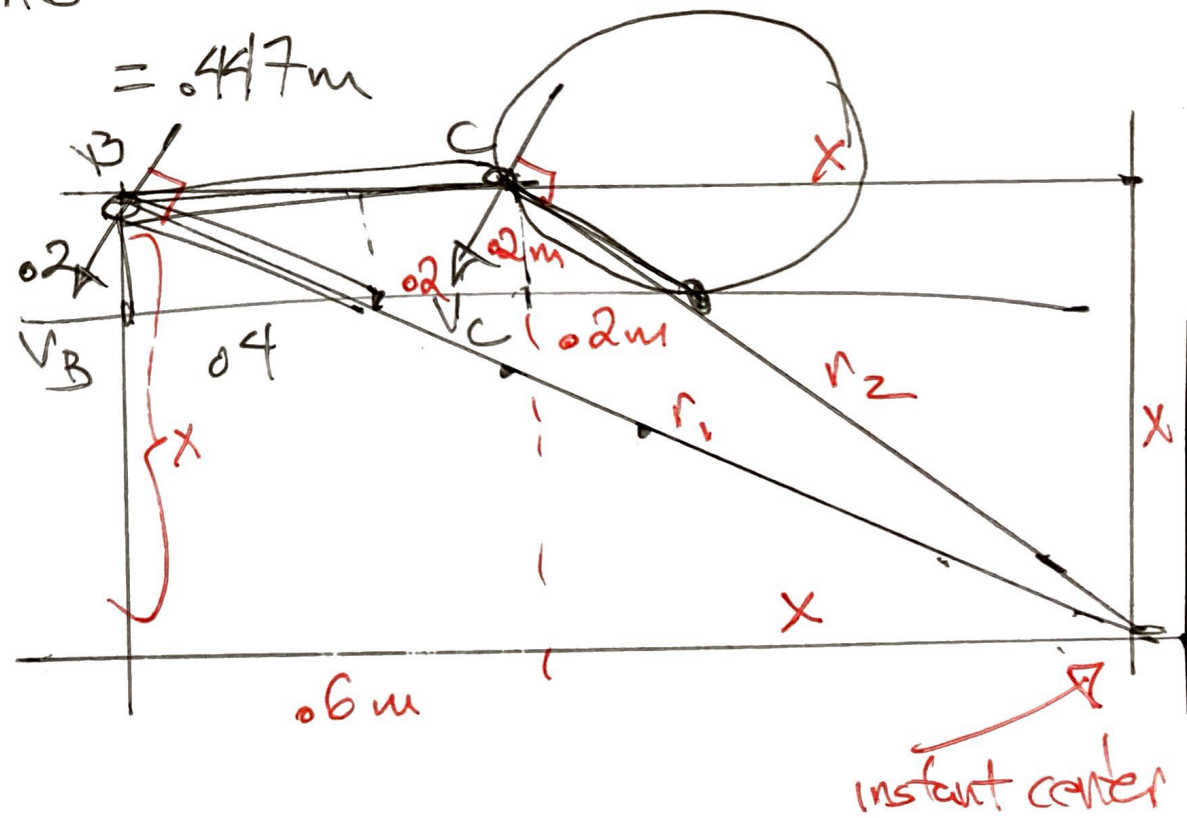
$$V_{B/O} = \omega_{AB} r_{AB}$$

$$r_{AB} = \sqrt{.2m^2 + .4m^2} = \sqrt{.04 + .16}$$

$$= .447m$$

$$V_{B/O} = 5\,rad/s \cdot .447m$$

$$V_{B/O} = 2.236\,m/s$$



Soln cont: Examining the previous drawing

$$\frac{x}{x+.6m} = \frac{.2m}{.4m} = \frac{1}{2} \quad \text{(similar } \Delta\text{'s)}$$

$$\Rightarrow 2x = x + .6m \Rightarrow \underline{x = .6m}$$

$$\Rightarrow r_1 = \sqrt{1.2^2 + .6^2} = \sqrt{1.44 + .36}\ m = \sqrt{1.8} = \underline{1.342m}$$

$$v_{B/O} = \omega_{BC} r_{B/center} \Rightarrow 2.236 m/s = \omega_{BC} 1.342m$$

$$\Rightarrow \omega_{BC} = \frac{2.236 m/s}{1.342\ m} = \underline{1.67 rad/s} \quad \text{CCW}$$

since V_C 'steeper' than V_B

Discussion: Interesting. Not sure how I feel about this as a 'special' technique but every Dynamics course discusses it at some level