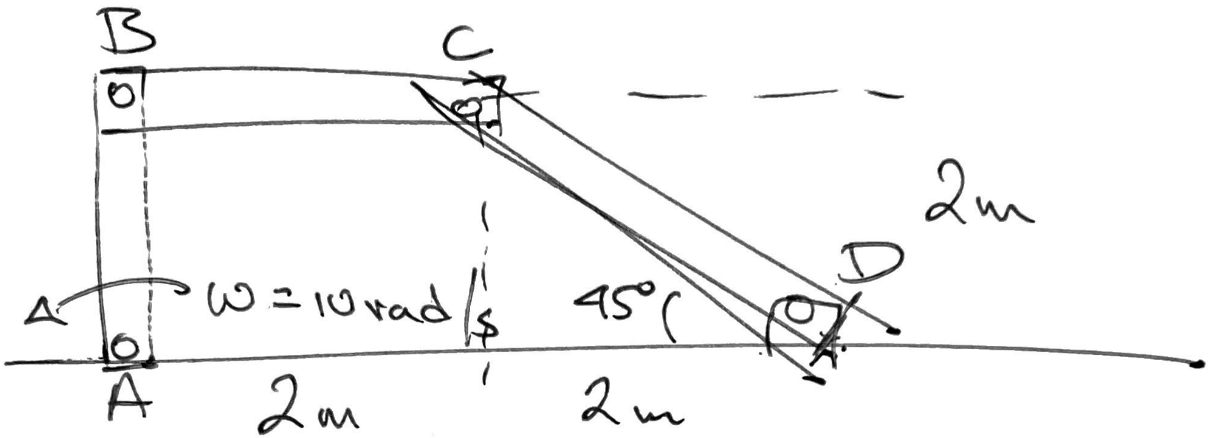
Given:



Req'd find ω_{BC} ~~BE~~ and ω_{CD}

Strategy Use technique of instantaneous centers

Assump smooth, no friction

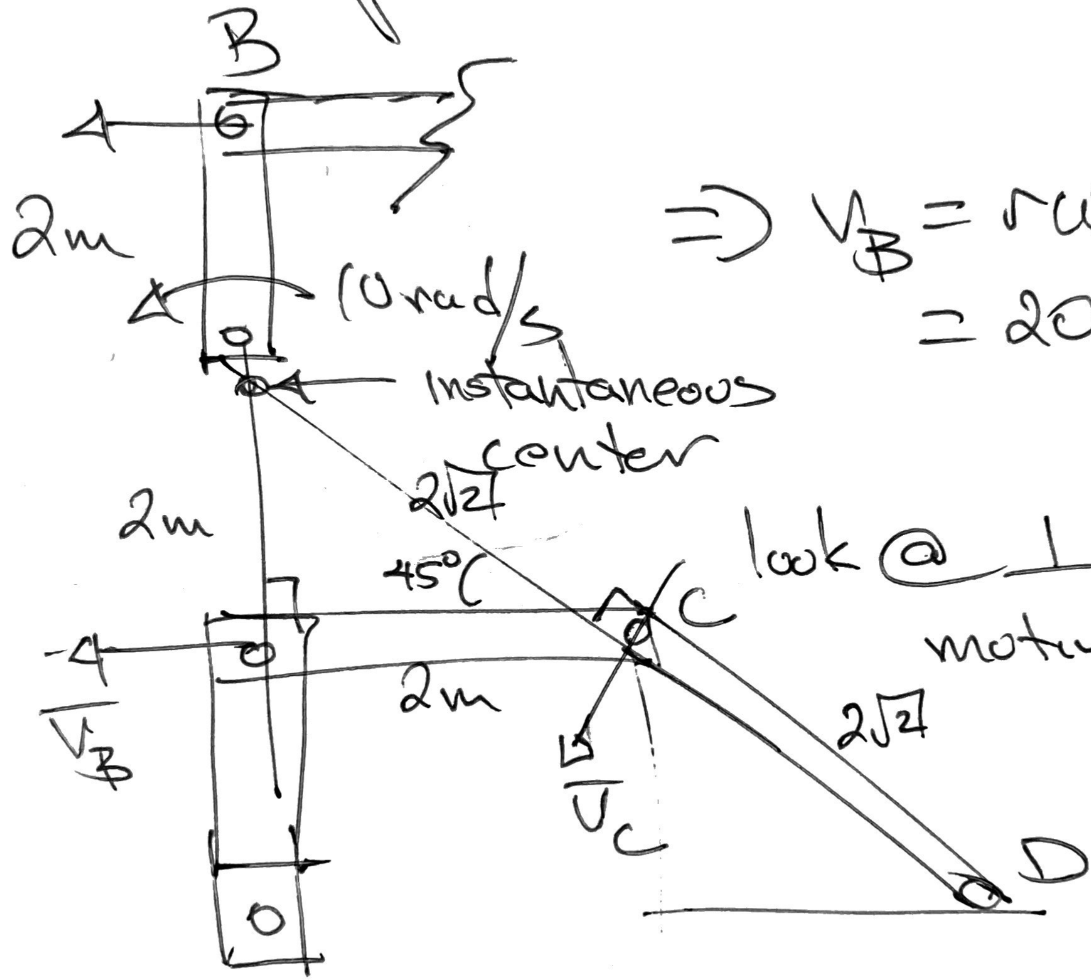
Estimate! ω_{BC} is ↻ as C is forced to drop.

ω_{CD} is ↺ as C drops.

both ω_{BC} & ω_{CD} feel like they should be **less** than 10 rad/s due to geometry

Soln

then:



$\Rightarrow V_B = r\omega = 2m(10 \text{ rad/s})$
$= 20 \text{ m/s}$

look @ $\perp$ to allowed motion!

$\Rightarrow V_{B/o} = \omega_{BC} \times r_{B/center} = 2m \sin 90^\circ \omega_{BC}$

$V_{B/o} = 20 \text{ m/s} = 2m\,\omega_{BC} \Rightarrow \underline{\omega_{BC} = 10 \text{ rad/s}}$

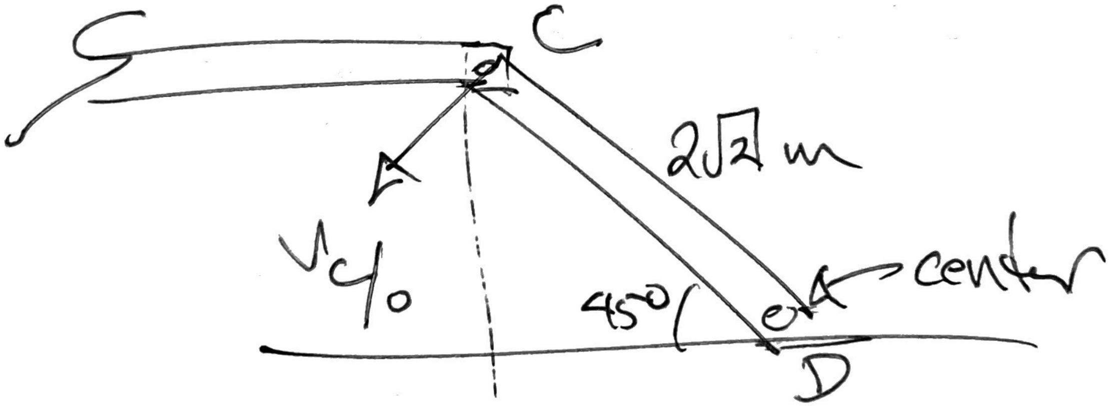
bigger than I expected.

Soln cont:

$$\Rightarrow V_{c/o} = \omega_{BC} \times r_{c/center} = \omega_{BC}\, r_{c/center}$$

$$r_{c/center} = 2\sqrt{2}\,,\ \omega_{BC} = 10\ \text{rad/s} \Rightarrow \underline{V_{c/o} = 20\sqrt{2}\ \text{m/s}}\ !$$

then



$$\Rightarrow V_{c/o} = \omega_{CD} \times r_{c/center(at\ D)} = \omega_{CD}\, 2\sqrt{2}\ \text{m}$$

$$\Rightarrow \omega_{CD} = \frac{20\sqrt{2}\ \text{m/s}}{2\sqrt{2}\ \text{m}} = \underline{10\ \text{rad/s}}$$

Discussion: My intuition sucks!