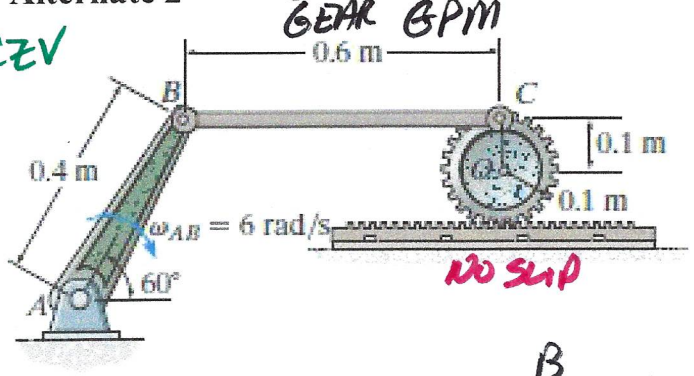
**Rigid Body Kinematics IV – Problem 2 Alternate 2**

If crank AB is rotating with an angular velocity of $\omega_{AB} = 6$ rad/s. determine the velocity of the center of the gear at the instant shown.




CLASSIFY MOTION
AB RAFA
BC GPM
GEAR GPM

NO SLIP

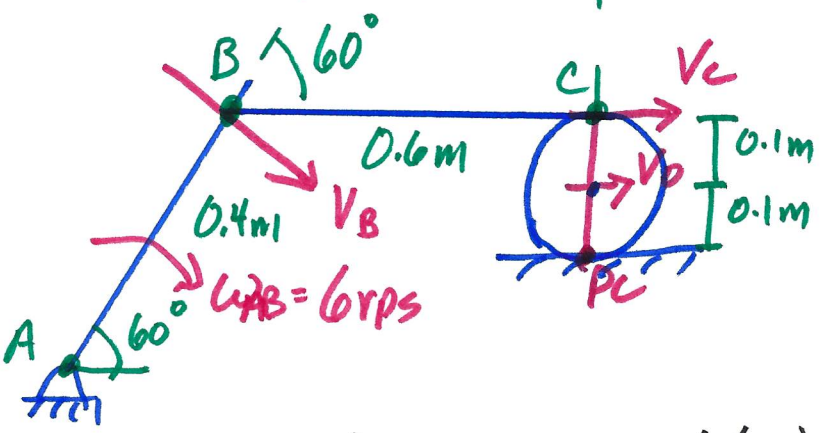
ICZV

A = 1.2m

B = 1.039m

$\tan 60 = \frac{B}{0.6}$ $B = 1.039m$

$\cos 60 = \frac{0.6}{A}$ $A = 1.2m$




$V_B = \omega_{AB} r_{AB} = 6(0.4) = 2.4$ m/s

$V_B = \omega_{BC} r_{B/IC} \Rightarrow 2.4 = \omega_{BC}\, 1.2$ $\omega_{BC} = 2$ rps ↻

$V_C = \omega_{BC} r_{C/IC} = 2\,(1.039) = 2.078$ m/s

$V_C = \omega_{GEAR} r_{C/PC} = 2.078 = \omega_{GEAR}(.2)$

$\omega_{GEAR} = 10.39$ rps ↺

$V_O = \omega_{GEAR} r_{GEAR} = 10.39(.1) = \underline{1.039 \text{ m/s} \rightarrow}$