Graphical Velocity Analysis of Linkages

Practice problems
Lectures 6 & 7
VELOCITY USING ICs

STEPS:

- Draw a diagram of the mechanism to scale
- Obtain necessary ICs needed for solutions
- Express the velocities at ICs based on input motions
- Write appropriate equations needed in calculating other velocities.
- Do above steps for all required velocities.
Problem 3.1

Problem Statement

For the mechanism shown in Figure P3.1, determine the magnitudes of the linear velocities of points B, C, and D using instantaneous centers.

\[ r_{O_2O_4} = 4.0 \text{ in}; \quad r_{O_2B} = 1.0 \text{ in} \]
\[ r_{BD} = 3.0 \text{ in}; \quad r_{O_4D} = 2.5 \text{ in} \]
\[ r_{BC} = 2.0 \text{ in}; \quad r_{CD} = 1.5 \text{ in} \]
\[ \theta_2 = 45^\circ; \quad \dot{\theta}_2 = 60 \text{ rad/sec CCW} \]
Problem 3.1

STEP 1

Figure P3.1
Problem 3.1

Step 2: Obtain necessary ICs needed for solutions

Step 3: Express the velocities at ICs based on input motions

\[ \mathbf{V} = \]

Step 4: Write appropriate equations needed in calculating other velocities.

\[ \mathbf{V} = \]