

1. Determine the degrees of freedom of the mechanism shown in figure P-1. (30%)

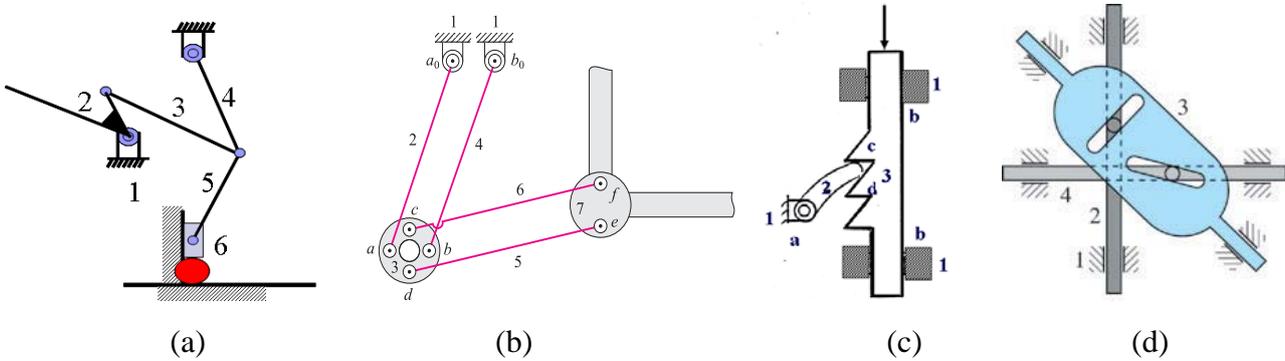


Figure P-1

2. Synthesize a four-bar linkage to generate the three rigid-body position shown in figure P-2. (Note: $A_1B_1=5\text{cm}$, $B_2A_3=2\text{cm}$) (40%)

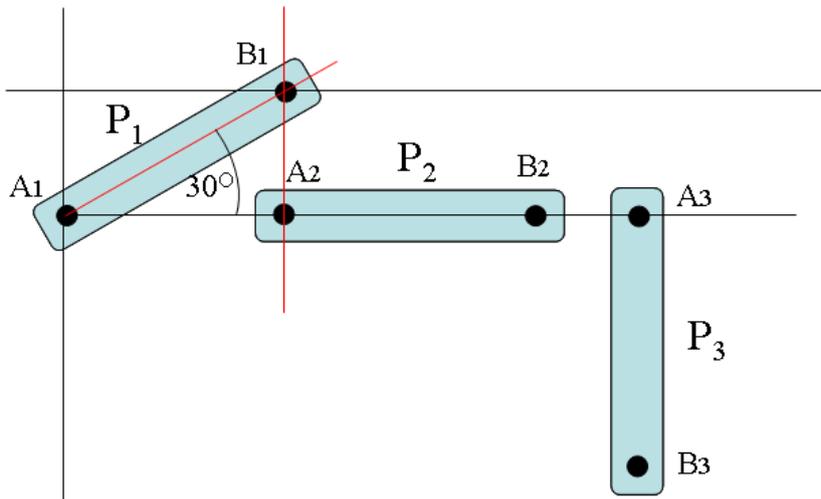


Figure P-2

3. For a mechanism shown in figure P-3, (a) find all instant centers, (b) use vector loop method, if $r_2=20\text{cm}$, $a_0b_0=40\text{cm}$, $r_4=8\text{cm}$, and $\theta_2 = 120^\circ$, $\omega_2 = 10\text{rad/s}$, find ω_4 . (30%)

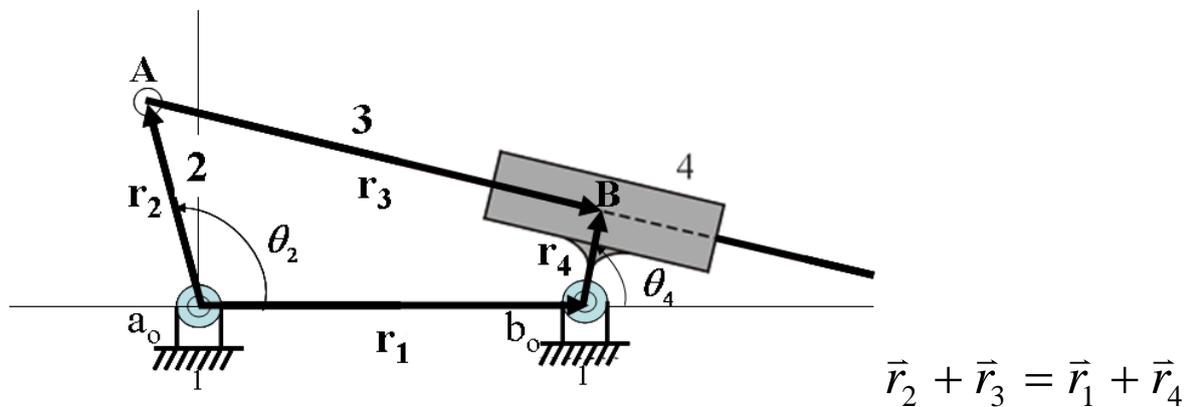


Figure P-3