

**FIGURE P7-5**

Problems 7-13 to 7-15

- 7-13 The linkage in Figure P7-5a has $O_2A = 0.8$, $AB = 1.93$, $AC = 1.33$, and offset = 0.38 in. The crank angle in the position shown is 34.3° and angle $BAC = 38.6^\circ$. Find α_3 , A_A , A_B , and A_C for the position shown for $\omega_2 = 15$ rad/sec and $\alpha_2 = 10$ rad/sec² in the directions shown,
- Using the acceleration difference graphical method.
 - Using an analytical method.
- 7-14 The linkage in Figure P7-5b has $I_{12}A = 0.75$, $AB = 1.5$, and $AC = 1.2$ in. The effective crank angle in the position shown is 77° and angle $BAC = 30^\circ$. Find α_3 , A_A , A_B , and A_C for the position shown for $\omega_2 = 15$ rad/sec and $\alpha_2 = 10$ rad/sec² in the directions shown,
- Using the acceleration difference graphical method.
 - Using an analytical method. (Hint: Create an effective linkage for the position shown and analyze it as a pin-jointed fourbar.)
- 7-15 The linkage in Figure P7-5c has $AB = 1.8$ and $AC = 1.44$ in. The angle of AB in the position shown is 128° and angle $BAC = 49^\circ$. The slider at B is at an angle of 59° . Find α_3 , A_B , and A_C for the position shown for $V_A = 10$ in/sec and $A_A = 15$ in/sec² in the directions shown.
- Using the acceleration difference graphical method.
 - Using an analytical method.