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 $BAC = 38.6°$. Find α_3, $\mathbf{A}_A$, $\mathbf{A}_B$, and $\mathbf{A}_C$ for the position shown for $\omega_2 = 15$ rad/sec and $\alpha_2 = 10$ rad/sec^2 in directions shown,

    a.   Using the acceleration difference graphical method.
    †b.   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 $BAC = 30°$. Find α_3, $\mathbf{A}_A$, $\mathbf{A}_B$, and $\mathbf{A}_C$ for the position shown for $\omega_2 = 15$ rad/sec and $\alpha_2 = 10$ rad/sec^2 in the directions shown,

    a.   Using the acceleration difference graphical method.
    †b.   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 $BAC = 49°$. The slider at B is at an angle of 59°. Find α_3, $\mathbf{A}_B$, and $\mathbf{A}_C$ for the position shown for $\mathbf{V}_A = 10$ in/sec and $\mathbf{A}_A = 15$ in/sec^2 in the directions shown.

    a.   Using the acceleration difference graphical method.
    †b.   Using an analytical method.