



schematic- not to scale

FIGURE P12-11

Problems 12-27 to 12-30

- †‡12-29 The linkage in Figure P12-11 has link lengths: $L_1 = 3.26$, $L_2 = 2.75$, $L_3 = 3.26$, $L_4 = 2.95$ in. All links are 0.5-in wide x 0.2-in thick steel. The square ends of link 3 extend 0.25 in beyond the pivots. Links 2 and 4 have rounded ends that have a radius of 0.25 in. Design counterweights to force balance the linkage using the Berkof-Lowen method.
- †‡12-30 Use the data of Problem 12-29 to design the necessary balance weights and other features to completely eliminate the shaking force and shaking moment the linkage exerts on the ground link.

† These problems are suited to solution using *Mathcad*, *Matlab*, or *TKSolver* equation solver programs.

‡ These problem solutions can be checked with program FOURBAR which is on the attached DVD.