

**FIGURE P12-7**

Problem 12-17

- †12-17 Figure P12-7 shows a system with three weights on a rotating shaft. $W_2 = 10 \text{ lb @ } 90^\circ$ at a 3-in radius, $W_3 = 10 \text{ lb @ } 180^\circ$ at a 4-in radius, and $W_4 = 8 \text{ lb @ } 315^\circ$ at a 4-in radius. Determine the magnitudes and angles of the balance weights needed to dynamically balance the system. The balance weight in plane 1 is placed at a radius of 4 in and in plane 5 of 3 in.

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