

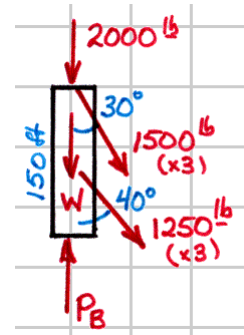
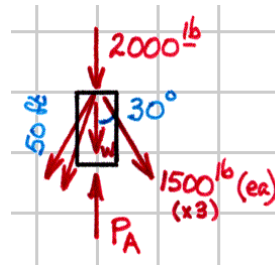
**1-59\***

Draw free-body diagrams of the sections of the tower between the points of interest and the top. For each section, the vertical component of the equation of equilibrium gives

$$\uparrow \Sigma F_y = 0: \quad P_A - 2000 - 3(1500 \cos 30^\circ) - W = 0$$

$$W = 40(50) = 2000 \text{ lb}$$

$$P_A = 7900 \text{ lb} \quad \text{..... Ans.}$$



$$\uparrow \Sigma F_y = 0: \quad P_B - 2000 - 3(1500 \cos 30^\circ) - 3(1250 \cos 40^\circ) - W = 0$$

$$W = 40(150) = 6000 \text{ lb}$$

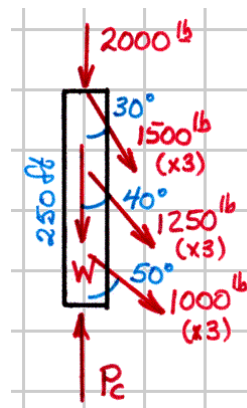
$$P_B = 14,770 \text{ lb} \quad \text{..... Ans.}$$

$$\uparrow \Sigma F_y = 0: \quad P_C - 2000 - 3(1500 \cos 30^\circ) - W$$

$$-3(1250 \cos 40^\circ) - 3(1000 \cos 50^\circ) = 0$$

$$W = 40(250) = 10,000 \text{ lb}$$

$$P_C = 20,700 \text{ lb} \quad \text{..... Ans.}$$



$$\uparrow \Sigma F_y = 0: \quad P_D - 2000 - 3(1500 \cos 30^\circ) - W$$

$$-3(1250 \cos 40^\circ) - 3(1000 \cos 50^\circ)$$

$$-3(750 \cos 60^\circ) = 0$$

$$W = 40(350) = 14,000 \text{ lb}$$

$$P_D = 25,800 \text{ lb} \quad \text{..... Ans.}$$

