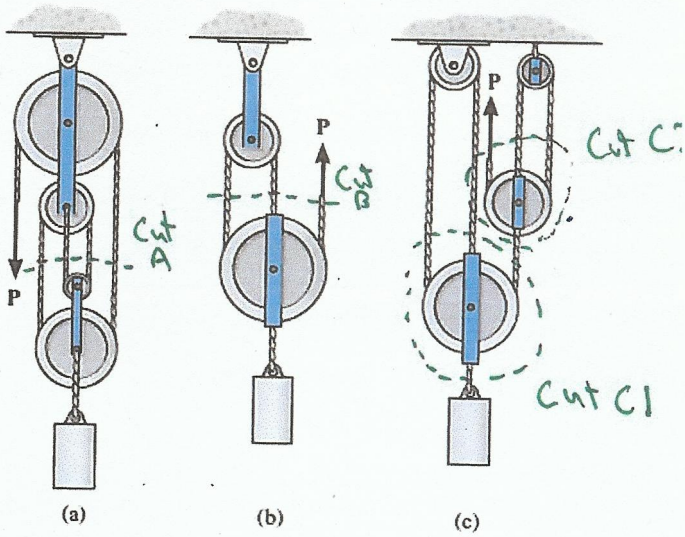
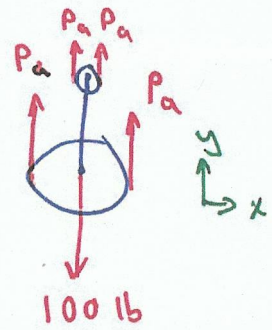
6–62

In each case, determine the force **P** required to maintain equilibrium. The block weighs 100 lb.



Cut A FBD

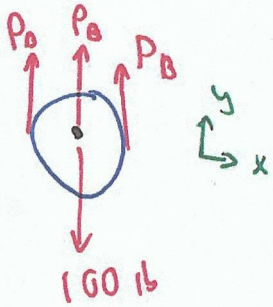


$\uparrow \Sigma F_y = 0$

$0 = 4P_a - 100\text{ lb}$

$\therefore P_a = 25\text{ lb}$

Cut B FBD

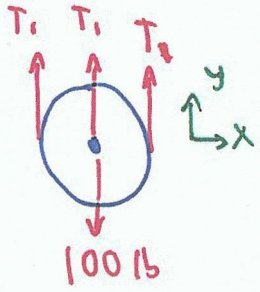


$\uparrow \Sigma F_y = 0$

$0 = 3P_B - 100\text{ lb}$

$\therefore P_B = 33.3\text{ lb}$

Cut C1 FBD

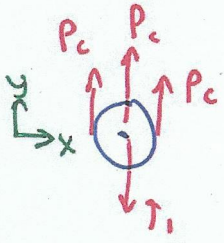


$\uparrow \Sigma F_y = 0$

$0 = 3T_1 - 100\text{ lb}$

$\therefore T_1 = 33.3\text{ lb}$

Cut C2 FBD



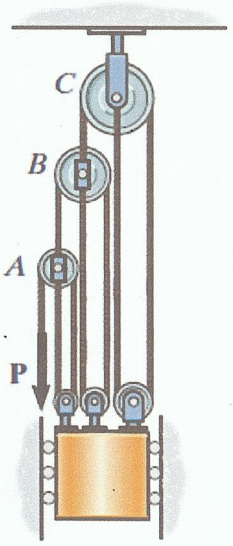
$\uparrow \Sigma F_y = 0$

$0 = 3P_c - 33.3\text{ lb}$

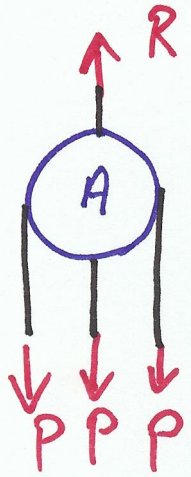
$\therefore P_c = 11.1\text{ lb}$

6–63.

Determine the force **P** required to hold the 50-kg mass in equilibrium.



FBD 1 (A)

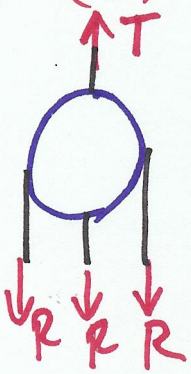


$\uparrow \Sigma F_y = 0$

$R - 3P = 0$

$R = 3P$

FBD 2 (B)

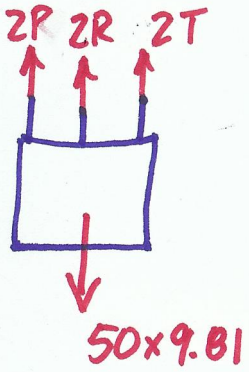


$\uparrow \Sigma F_y = 0$

$T - 3R = 0$

$T = 3R = 9P$

FBD 3 (Block)



$\uparrow \Sigma F_y = 0$

$2R + 2R + 2T - 490.5 = 0$

$2(P) + 2(3P) + 2(9P) = 490.5$

$P = 18.9\ N$