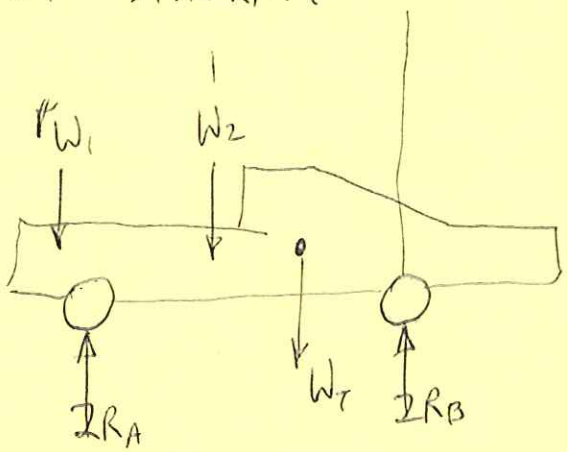
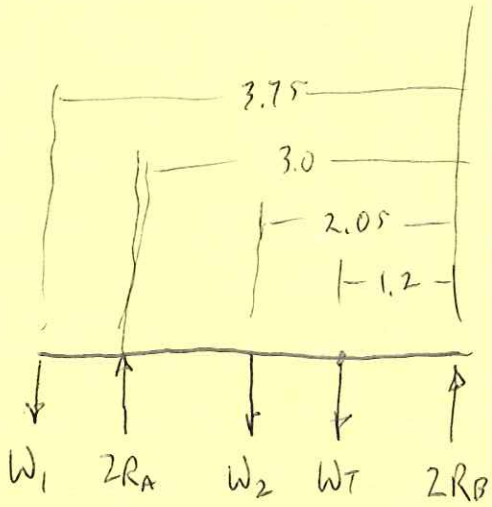
EXAMPLE PROB. 4.1

FREE-BODY DIAGRAM:





$\Sigma F_y = 0$:

$$-W_1 - W_2 - W_T + 2R_A + 2R_B = 0$$

$$R_A + R_B = \frac{1}{2}(W_1 + W_2 + W_T) \qquad \text{EQN. (1)}$$

$\Sigma M_B = 0$ $+\circlearrowleft$

$$1.2W_T + 2.05W_2 - 3.0(2R_A) + 3.75W_1 = 0$$

$$R_A = 0.2W_T + 0.342W_2 + 0.625W_1 \qquad \text{EQN. (2)}$$

$$W_1 = m_1 g = (350\ kg)\left(9.8\ \frac{m}{s^2}\right) = 3430\ N$$

$$W_2 = 3430\ N$$

$$W_T = m_T g = (1400\ kg)\left(9.8\ \frac{m}{s^2}\right) = 1.37 \times 10^4\ N$$

EQN. (2):

$$R_A = (0.2)(1.37 \times 10^4) + 0.342(3430) + 0.625(3430)$$

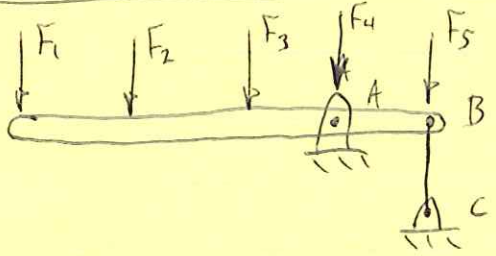
$$R_A = 6060\ N = 6.06\ kN$$

EQN. (1):

$$R_B = \frac{1}{2}(3430 + 3430 + 1.37 \times 10^4) - 6060\ N$$

$$R_B = 4220\ N = 4.22\ kN$$

EXAMPLE PROB. 4.4



FIND REACTION AT A, TENSION IN CABLE BC.

FREE-BODY DIAGRAM OF BAR: