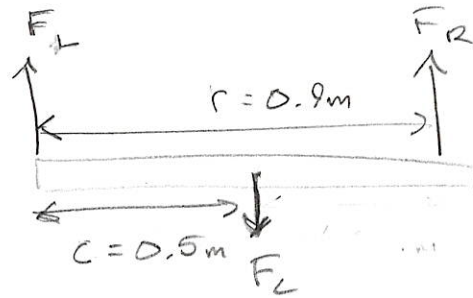


SEH

#1



* Note: I solved for Part b first

$$\sum \tau = 0$$

$$F_L - c F_c + r F_R = 0$$

$$* b) \quad F_R = \frac{c F_c}{r} = \frac{c M g}{r} = \frac{0.5 \text{ m} (210 \text{ kg}) (9.8 \text{ m/s}^2)}{0.9 \text{ m}} = 1.14 \text{ N}$$

$$a) \quad \sum F = 0$$

$$F_L - F_c + F_R = 0$$

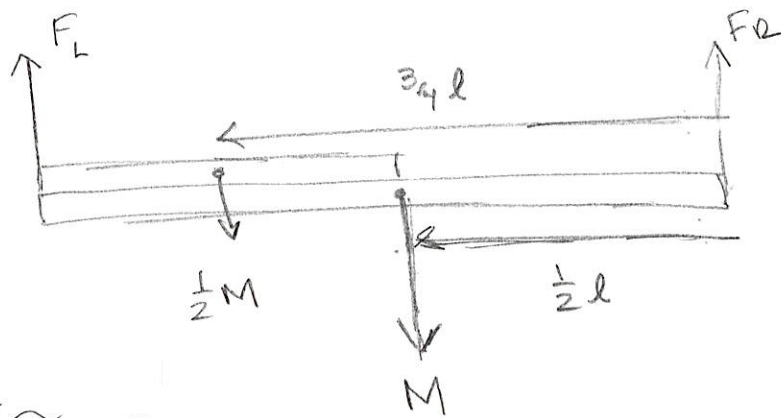
$$F_L = F_c - F_R$$

$$= M g - F_R$$

$$= (0.210 \text{ kg}) (9.8 \text{ m/s}^2) - 1.14 \text{ N}$$

$$F_L = 0.91 \text{ N}$$

SEH #2



$$M = 800 \text{ kg}$$

$$\sum \tau = 0$$

$$F_R + \frac{1}{2} l M g + \frac{3}{4} l \frac{1}{2} M g - l F_L = 0$$

$$F_L = \frac{\frac{1}{2} l M g + \frac{3}{4} l \frac{1}{2} M g}{l} = \frac{1}{2} M g + \frac{3}{4} \frac{1}{2} M g = \frac{7}{8} M g$$

$$F_L = \frac{7}{8} (800 \text{ kg}) (9.8 \text{ m/s}^2)$$

$$\boxed{F_L = 6860 \text{ N}}$$

$$\sum F = 0$$

$$F_L + F_R - \frac{1}{2} M g - M g = 0$$

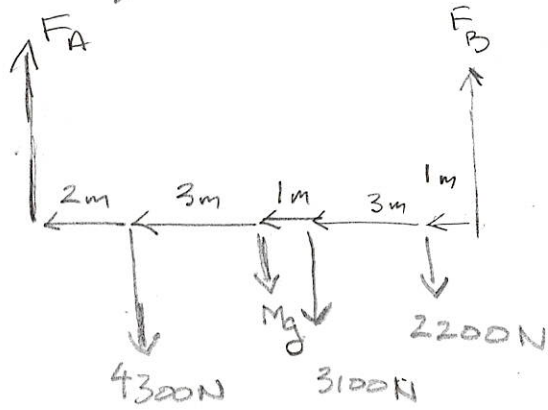
$$F_R = \frac{1}{2} M g + M g - F_L$$

$$= \frac{3}{2} M g - F_L$$

$$= \frac{3}{2} (800 \text{ kg}) (9.8 \text{ m/s}^2) - 6860 \text{ N}$$

$$\boxed{F_R = 4900 \text{ N}}$$

SEH #3



$$M = 200\text{ kg}$$

$$\sum \tau = 0$$

$$F_B + l_1 F_{22} + l_4 F_{31} + l_5 M_g + l_8 F_{43} - a F_A = 0$$

$$F_A = \frac{l_1 F_{22} + l_4 F_{31} + l_5 M_g + l_8 F_{43}}{a}$$

$$F_A = \frac{1\text{ m}(2200\text{ N}) + 4\text{ m}(3100\text{ N}) + 5\text{ m}(200\text{ kg})(9.8\text{ m/s}^2) + 8\text{ m}(4300\text{ N})}{10\text{ m}}$$

$$F_A = 5880\text{ N}$$

$$\sum F = 0$$

$$F_A + F_B - F_{43} - M_g - F_{31} - F_{22} = 0$$

$$F_B = F_{43} + M_g + F_{31} + F_{22} - F_A$$

$$= 4300\text{ N} + (200\text{ kg})(9.8\text{ m/s}^2) + 3100\text{ N} + 2200\text{ N} - 5880\text{ N}$$

$$F_B = 5680\text{ N}$$