

Chapter 10 - Continued & Chapter 11 - Static Equilibrium

Physics 206

Group 1 Problems:

Problem 1:

$$(a) \tau = \frac{\ell}{2} Mg \sin(90)$$

$$(b) \omega = \sqrt{\frac{Mg\ell}{I}}$$

$$(c) L = \sqrt{MgI\ell}$$

Problem 2:

$$R = \left(\frac{mR_0^2 v_0^2}{F_T} \right)^{1/3}$$

$$R = 0.354 \text{ m}$$

Problem 3:

$$(a) \omega = \frac{6v}{19\ell}$$

$$(b) \text{Ratio} = \frac{3}{19}$$

Group 2 Problems:

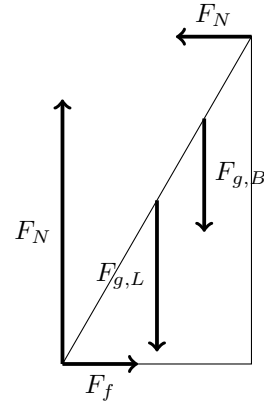
Problem 4:

$$h_f = \frac{9m^2}{(6m + M)^2} h$$

Problem 5:

$$(a) \text{ and } (b) \omega_f = \frac{M\ell^2 + 24mx^2}{M\ell^2 + 6m\ell^2} \omega$$

Problem 6:



$$(b) F_N = \left(\frac{M}{2} + \frac{3m}{4} \right) g \cot \theta$$

$$(c) F_N = (M + m)g$$

$$\mu = \frac{\frac{M}{2} + \frac{3m}{4}}{M + m} \cot \theta$$

Group 3 Problems:

Problem 7:

$$(a) F_B = 2mg$$

$$F_B = 1.47 \text{ N}$$

$$F_C = \frac{mgR}{2R \cos \theta}$$

$$F_C = 0.424 \text{ N}$$

$$F_A = F_C$$

$$(b) F_N = \frac{F_C}{\sin \theta}$$

$$F_N = 0.848 \text{ N}$$

Problem 8:

$$(a) F_T = 525 \text{ N}$$

$$(b) F_y = 328 \text{ N}$$

$$F_x = 222 \text{ N}$$

$$(c) \mu = 1.48$$