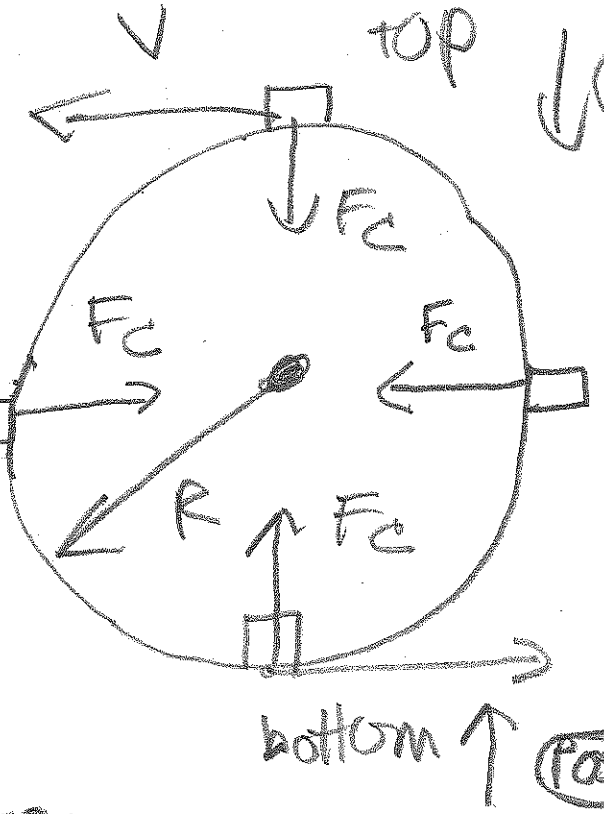
Test 2 review

ch 6: 11.

10-19-13



$$\frac{mv^2}{R} = F_c$$

$$F_c = \frac{mv^2}{R}$$

$$\Sigma F_R = \frac{mv^2}{R} = \text{pos-neg.}$$

pos is always <u>toward</u> center.

(a) $v = ?$

$R = 500(m)$

period $= T = 60(s)$

$$v = \frac{2\pi R}{T} = \frac{(6.28)(50)}{(60)} \frac{m}{s}$$

$$= 5.23 \text{ m/s}$$

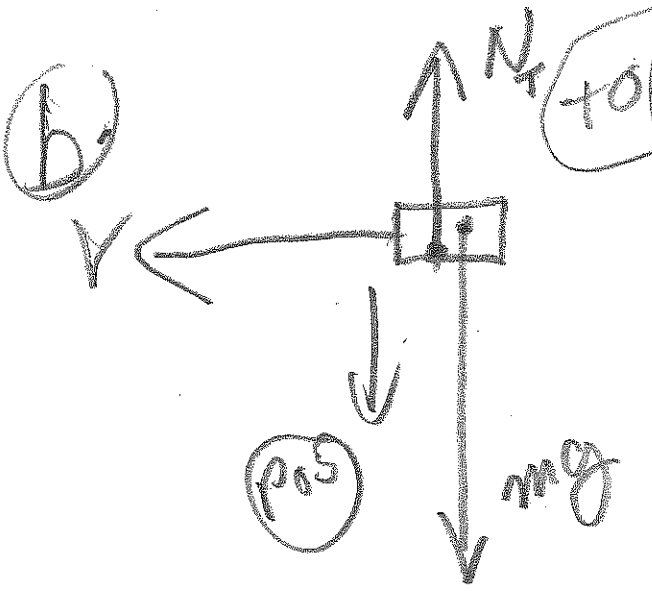
(b) $mg = 582\ N$ ($m \approx 88 kg \rightarrow 180 lbs$)

(11.)

(b.) apparent weight = ?

$|\text{apparent weight}| = N$

(b.)



$\sum F_R = \text{pos} - \text{neg}$

$\frac{mv^2}{R} = mg - N$

$N_T = mg - \frac{mv^2}{R}$

$= m\left(g - \frac{v^2}{R}\right)$

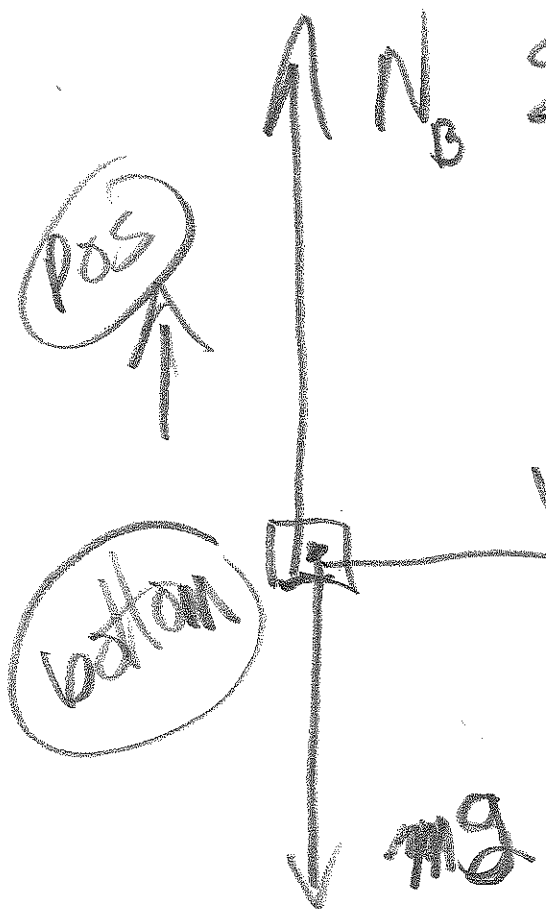
$= \left(\frac{882}{9.8}\right)\left(9.8 - \frac{5.23^2}{50}\right)$

$= (90)(9.8 - 0.547)$

$N_T = 832.7\,(N)$

$832.7 < 882$

(3



$$\Sigma F_R = \frac{mv^2}{R}$$

$$\frac{mv^2}{R} = pos - mg$$

$$= N - mg$$

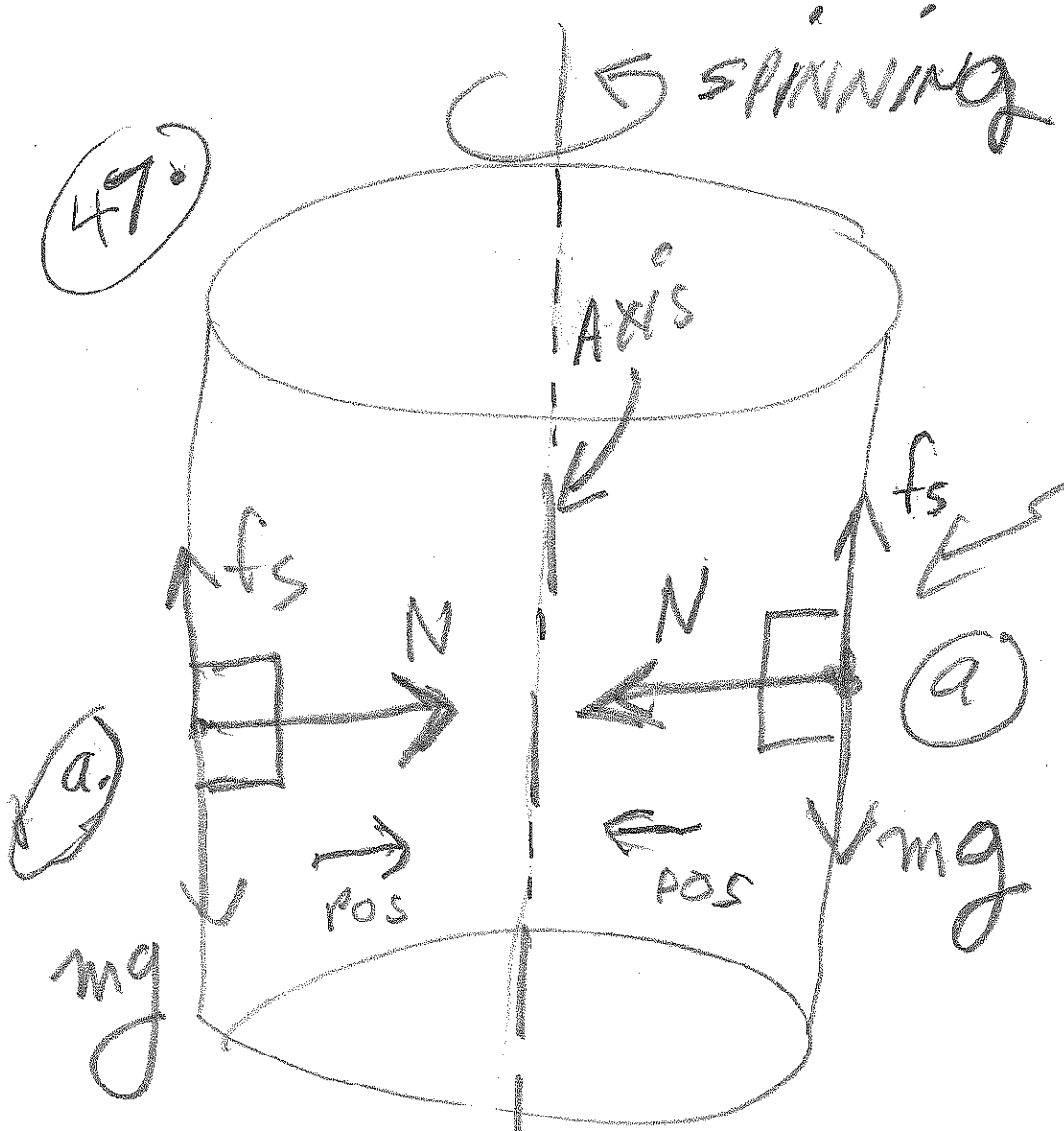
$$N_b = m\cdot\left(g + \frac{v^2}{R}\right)$$

$$N_b = (90)(9.8 + 0.547)$$

$$N_b = (90)\cdot(10.347)$$

$$N_b = \boxed{931.23} > 882$$

47.



(a)

$\Sigma F_y = pos - neg$

$0 = f_s - mg$

$f_s = mg$

$\mu_s N = mg$

$\Sigma F_R = pos - neg$

$\frac{mv^2}{R} = N - 0$

$\frac{mv^2}{R} = N$

$\frac{mv^2}{R} = \frac{mg}{\mu_s}$

(b)

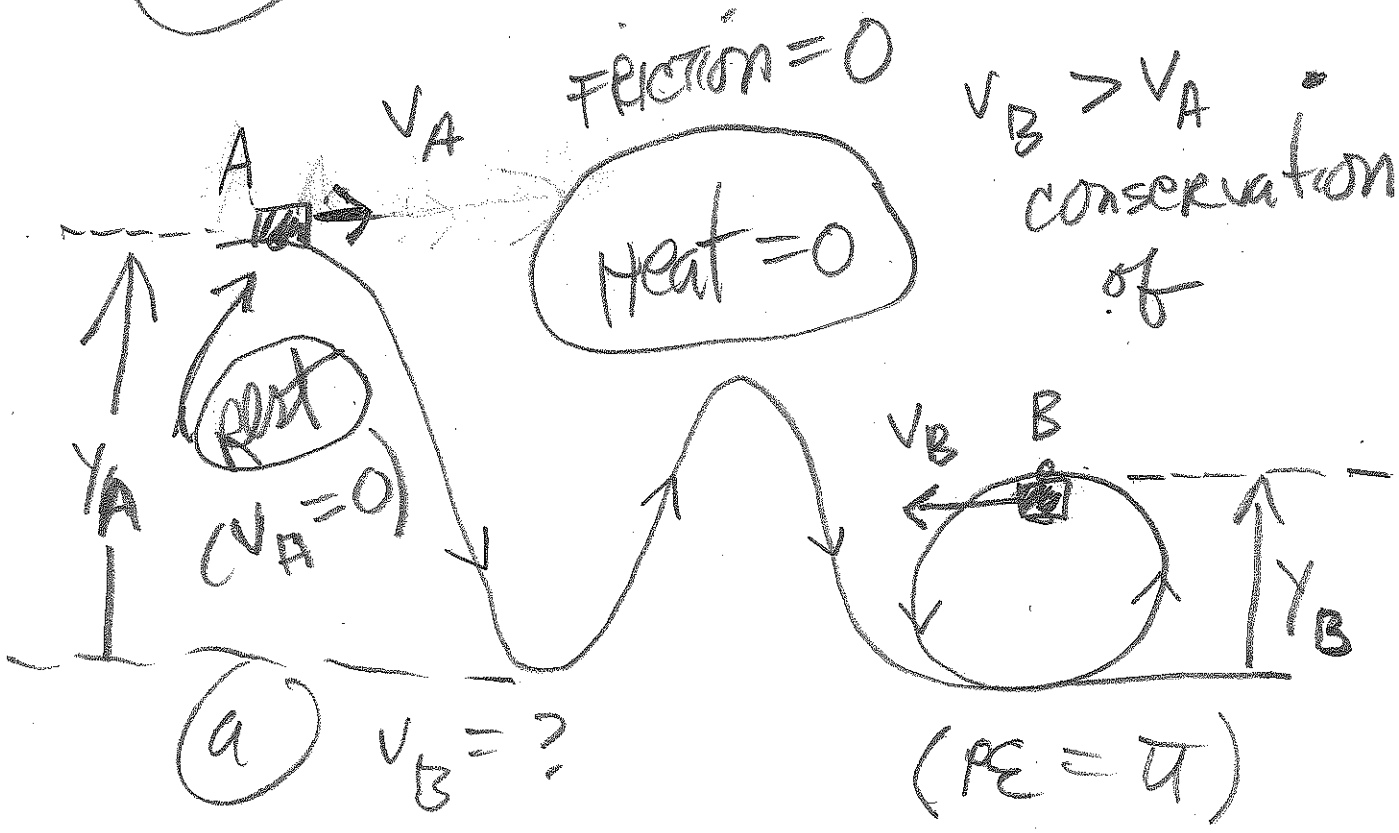
$\mu_s = \frac{gR}{v^2}$

(c) Does NOT depend on m.

CH 7 JUMP START: CH 7

(48), (87.) will be reviewed

(87.)



$$KE_A + PE_A = KE_B + PE_B$$

$$\downarrow$$

$$0 + mgy_A = \frac{1}{2}mv_B^2 + mgy_B$$

$$mgy_A = \frac{1}{2}mv_B^2 + mgy_B$$

$$v_B^2 = 2g(y_A - y_B)$$

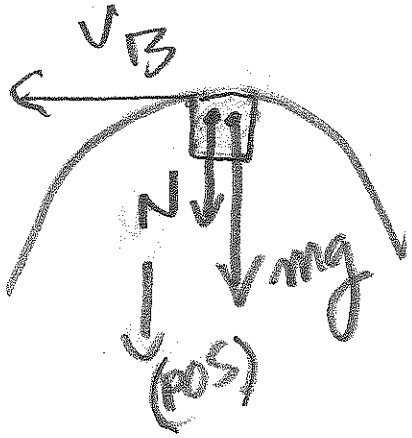
$$v_B^2 = (19.6)(25 - 12)$$

$$v_B^2 = (19.6)(13)$$

$$v_B^2 = 254.8\ m^2/s^2$$

$$v_B \approx \boxed{16\ \frac{m}{s}}$$

(b) $N = ?$



$$\Sigma F_R = \text{pos} - \text{neg}$$

$$\frac{mv^2}{R} = mg + N - 0$$

#E7

(7)

(b) $N_{bot} = m \cdot \left(\frac{v^2}{R} - g\right)$

$= (350) \cdot \left(\frac{v^2}{R} - g\right)$

$= (350) \cdot \left(\frac{256}{6} - 9.8\right)$

$N_{bot} = 1150\,(N) < \underbrace{mg}_{3500(N)}$