2A 10-11-13

CH3, CH4, CH5, CH6, CH7 (E.C.?)

REVIEW

ALSO POST/DISCUSS CH7

MAKE A LIST TEST REVIEW

BASED ON EXISTING

LECTURE NOTES

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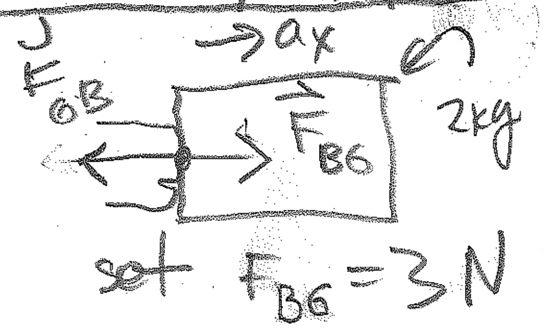
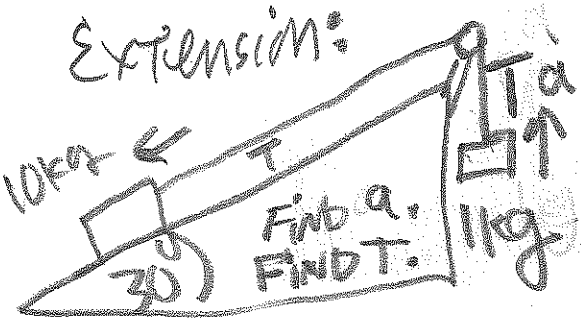
DATE	CH	TOPICS
9-21	3	PRJ. MOTION (2D) CIRCULAR " (2D) RELATIVE " (2D)
10-1	4	NEWTONS LAWS
10-4	5	APPLICATIONS OF NEWTONS LAW

Lecture's note LIST

date	CH	TOPIC	problems
9-13-13	3	PROJ MOTION	example 3.4
9-15-13	3	PROJ MOTION, CIRCULAR MOTION	SAMPLE TEST A: problem 3 problem 5 → MASS WAS NOT needed. $\frac{V^2}{R} = a_c = 8.0 \frac{m}{s^2}$ $\frac{V^2}{0.75m} = 8.0 \frac{m}{s^2}$ FIND V. SAMPLE TEST B: problem 3.
9-16-13	3		SAMPLE TEST A: # 3

Date	Ch	topic	problems
9-16	3	circ. motion	circular motion lecture
9-16	3	2D relative motion	example of boat on a river correction page 16 $\lvert\vec{V}_{BS}\rvert = \sqrt{(4\frac{m}{s})^2 + (3\frac{m}{s})^2}$ NOT: $\lvert\vec{V}_{BR}\rvert = 4\frac{m}{s}$ $\lvert\vec{V}_{BS}\rvert = \sqrt{16+9}\,\frac{m}{s}$ $\lvert\vec{V}_{BS}\rvert = 25\frac{m}{s}$
9-18	4	N's laws	Example 4
9-18	4		 set $F_{BG} = 3N$ $a_x = 3/2\ m/s^2$

Date	CH	topic	problem
9-20	3	PJM CIRCULAR MOTION	test 1 solutions; Problem 4 Problem 5 * * $\frac{v^2}{R} = 8.0\ m/s^2$ $v = 2.6\ m/s$
9-20	6	CIRCULAR DYNAMICS	$F_c = \frac{mv^2}{R} = \frac{(2.2kg)(2.57\ m/s)^2}{0.75m}$ $= (2.2kg)(8.0\ m/s^2)$ $= 17.6\ (N)$
9-23	5	APPS. N LAWS	example 3 example 6 example 7 Extension:



Date	CW	Topic	Problem
10-11-13	5	Applications Newton's Laws	46, 60
	6	Circular Dynamics	48, 10, 11
	7	Energy	87, 55, 56, 58, 54

more test 2 review problems:

(46), (60.) ← CH 5

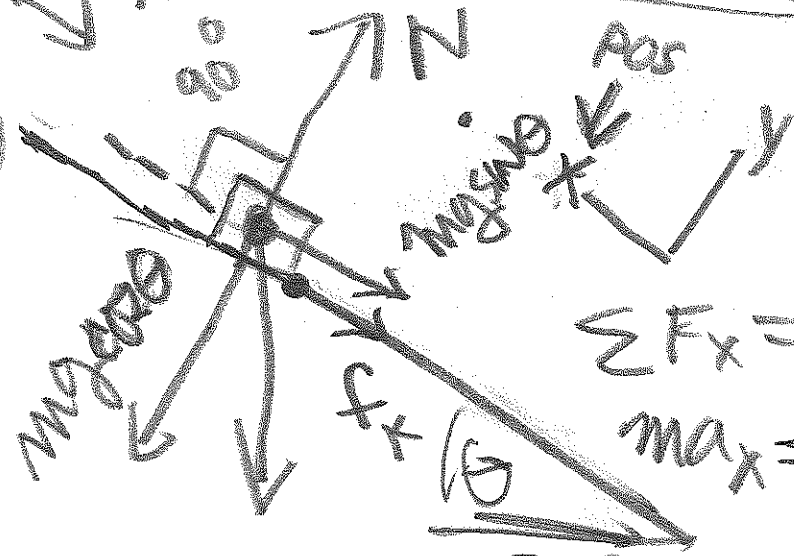
CH 6 → (43.) (10.) (11.)

CH 7 → (8)* (55) (56) (48) (54)

* uses CH 6

(46.) rest at top

(a.)



$\Sigma F_x = POS - mg_y$

$ma_x = 0 - mg\sin\theta - f_K$

$\Sigma F_y = ma_y = 0 = N - mg\cos\theta$

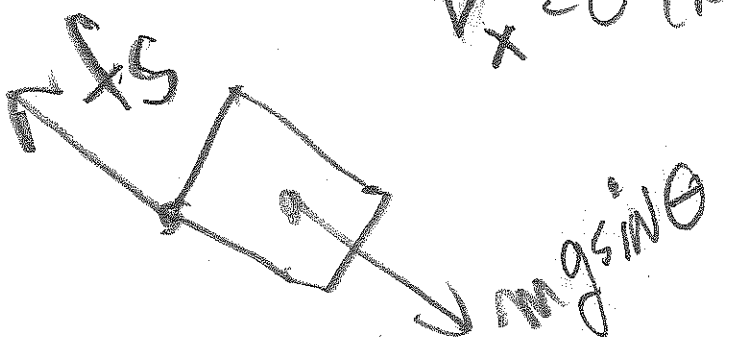
$N = mg\cos\theta$

$$f_k = \mu_k \cdot N$$

$$ma_x = 0 - mg\sin\theta - \mu_k mg\cos\theta$$

$$a_x = -g\sin\theta - \mu_k g\cos\theta$$

highest point: $v_x = 0$ (rest)



CHECK IF $f_{sMAX}^{*} \geq mg\sin\theta$

$f_{sMAX}^{*} = \mu_s \cdot N$

$\mu_s \cdot mg\cos\theta \geq mg\sin\theta$

$\mu_s \geq \tan\theta$

$\mu_s \overset{?}{\geq} \tan 40$

$0.40 \geq \tan 40$

but $\tan 40 = 0.84$

$\mu_s < \tan 40$ *

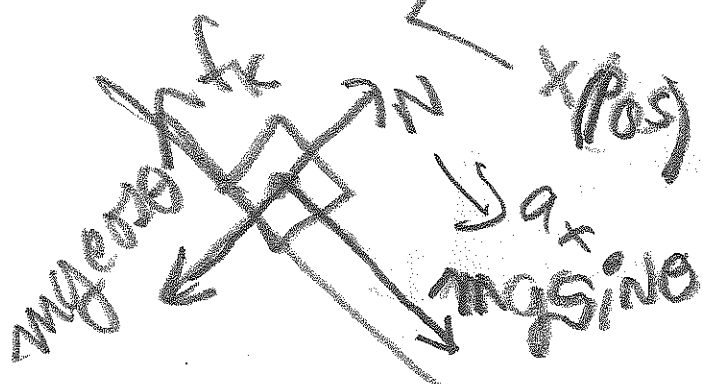
inequality

NO

YES

remains at rest

goes DOWN *



$\sum F_x = pos - neg$

$ma_x = mg\sin\theta - f_k$

$f_k = \mu_k mg\cos\theta$

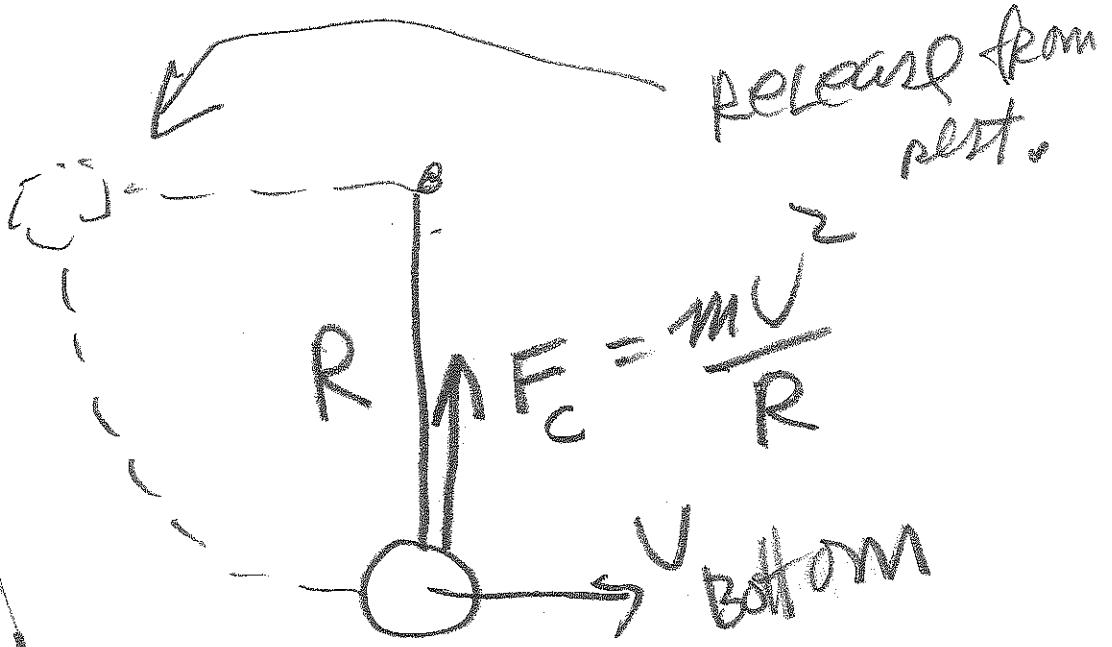
$a_x = g\sin\theta - \mu_k g\cos\theta$ DOWN

$|a_x|_{DOWN} < |a_x|_{UP}$

ch 6

6

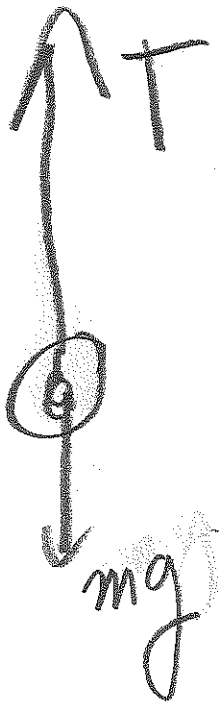
10.



pos toward center

ΣF_R = pos − neg

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



(a) $a = \frac{v^2}{R}$

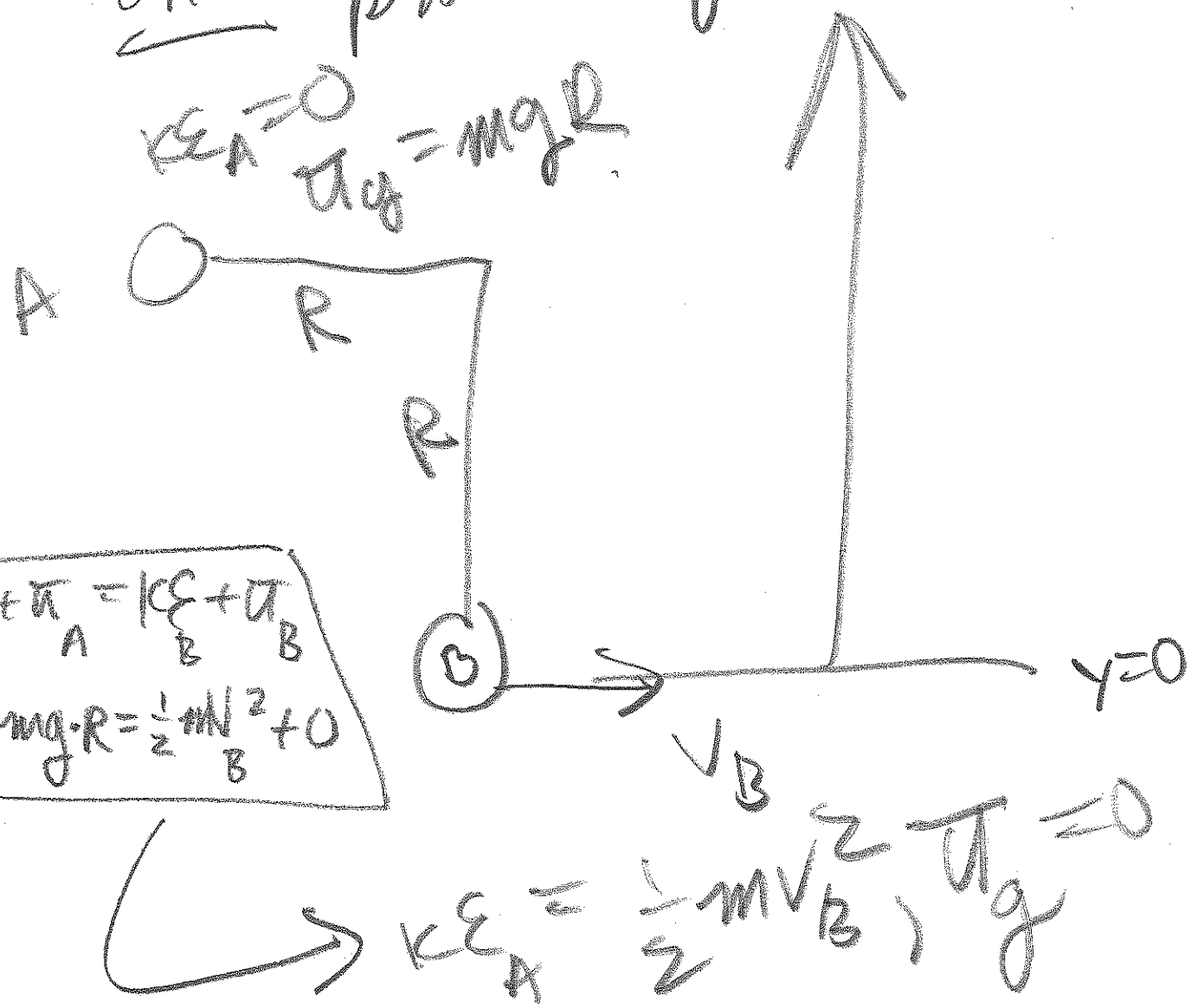
$= \frac{(4.20)^2}{3.8}$

(b) $T = \frac{mv^2}{R} + mg$

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

ch 7 extension for (9
#10, ch 6

CH 7 problem from (10), ch 6



$KE_A + U_A = KE_B + U_B$

$0 + mgR = \frac{1}{2}mV_B^2 + 0$

$KE_A = \frac{1}{2}mV_B^2$, $U_g = 0$

$$mgR = \frac{1}{2}mV_B^2$$

$$V_B = \sqrt{2gR} = \sqrt{(19.6)(3.8)}$$

$$= 8.6\ m/s > 4.20\ m/s$$