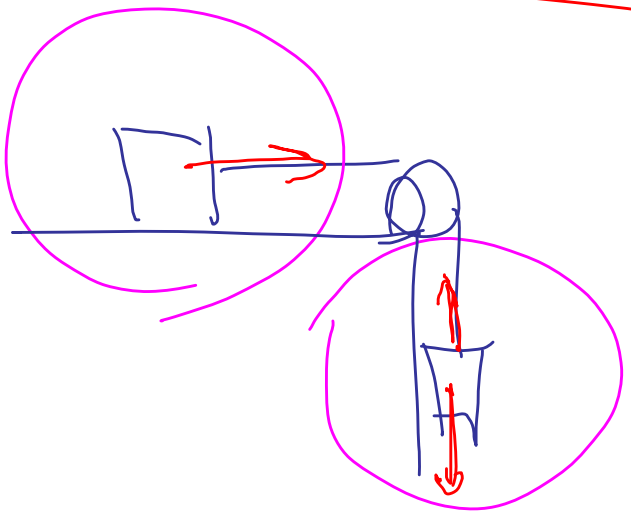
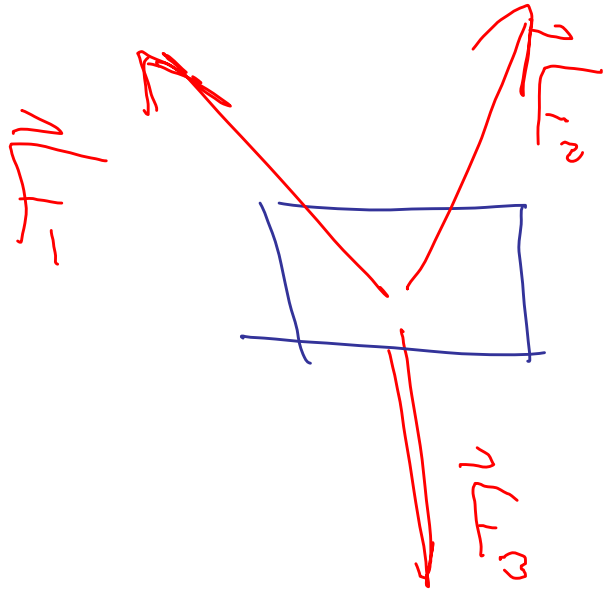
Phys 2110-5 9/24/12

Note Title 9/24/2012

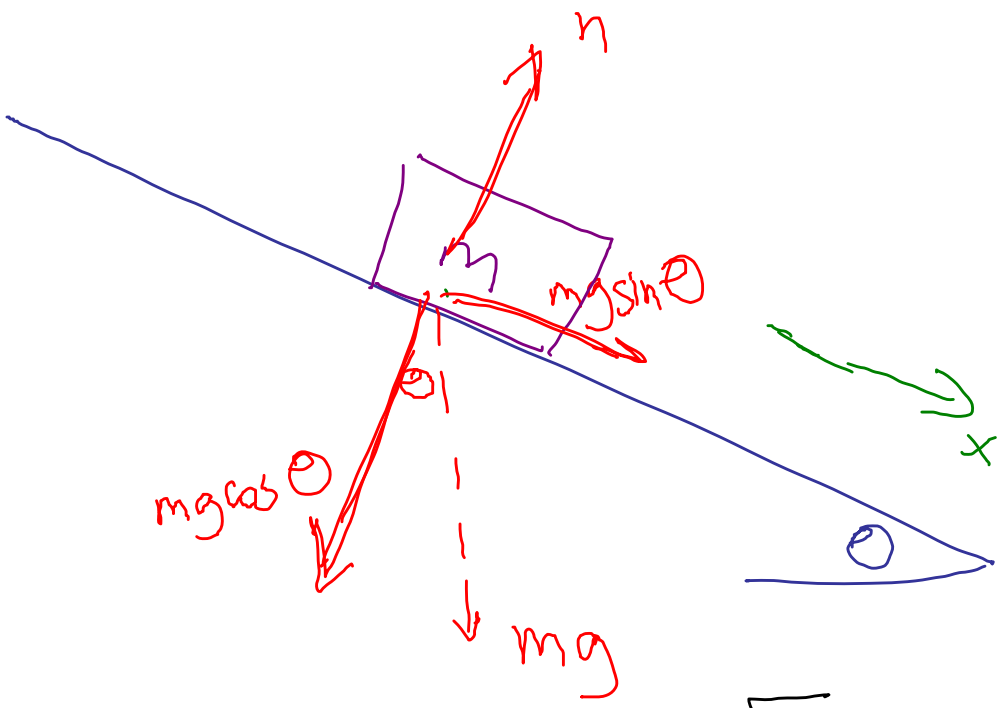
Forces Chap 4

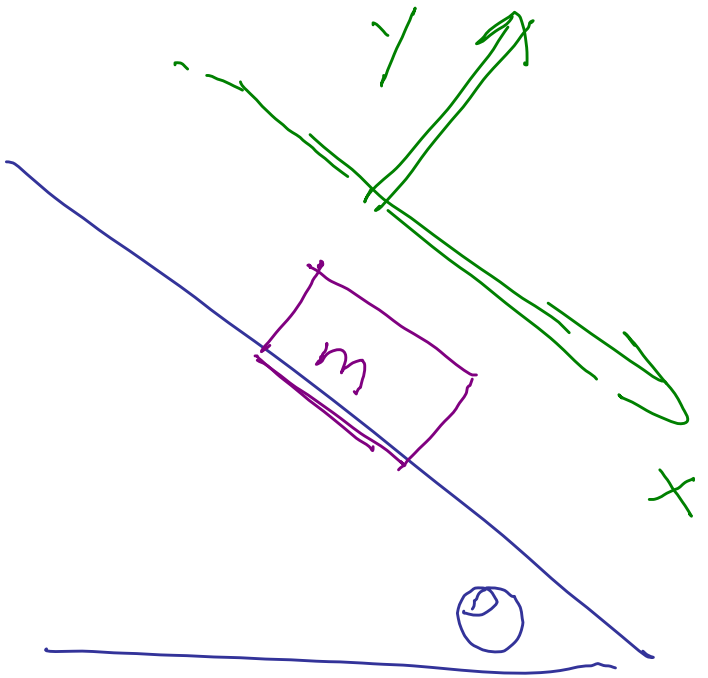
$$\vec{F}_{net} = m\vec{a}$$





Inclined plane (smooth)





x motion

x accel.

No y accel.

$n = mg\cos\theta$

$F_{y\,net} = 0 = ma_y$

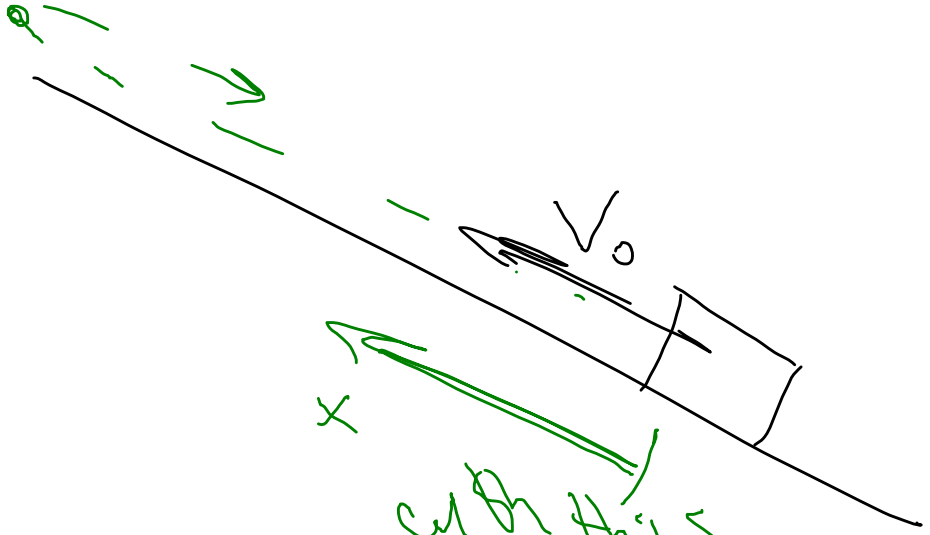
$a_y = 0$

$F_{x,net} = mg\sin\theta = ma_x$

$mg\sin\theta = ma_x$

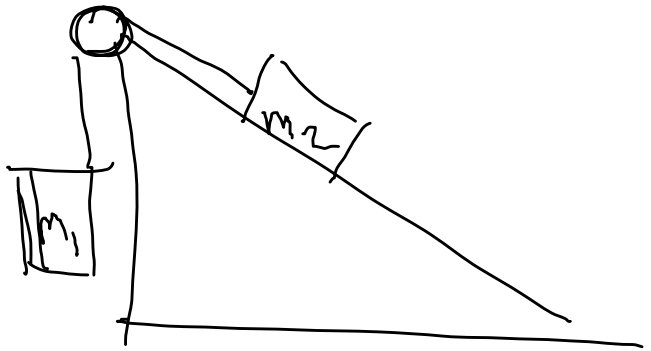
$$a_x = g\sin\theta$$

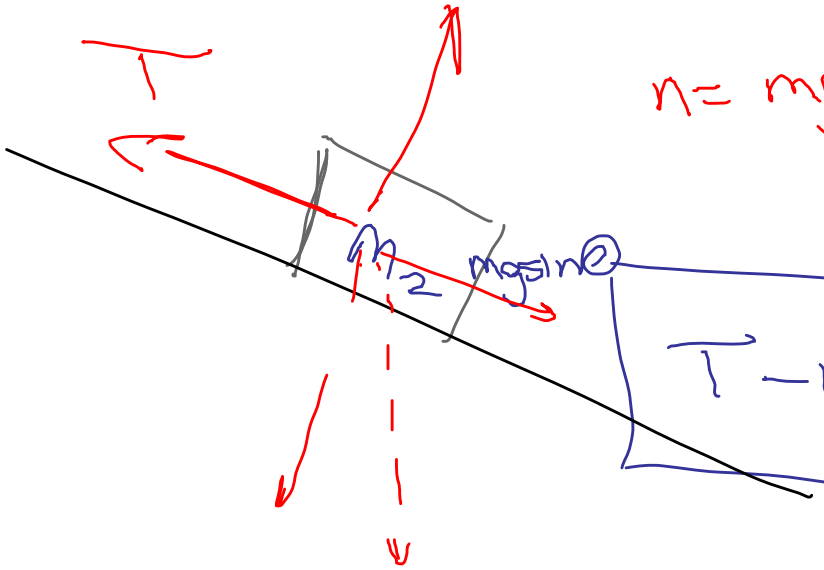
On inclined plane, (with no other forces) acceleration is $g\sin\theta$, down slope



with this choice, $a_x = -g\sin\theta$

Example:





$$m_1 g - T = m_1 a$$

$$T - m_2 g \sin\theta = m_2 a$$

Springs

(Ideal spring)

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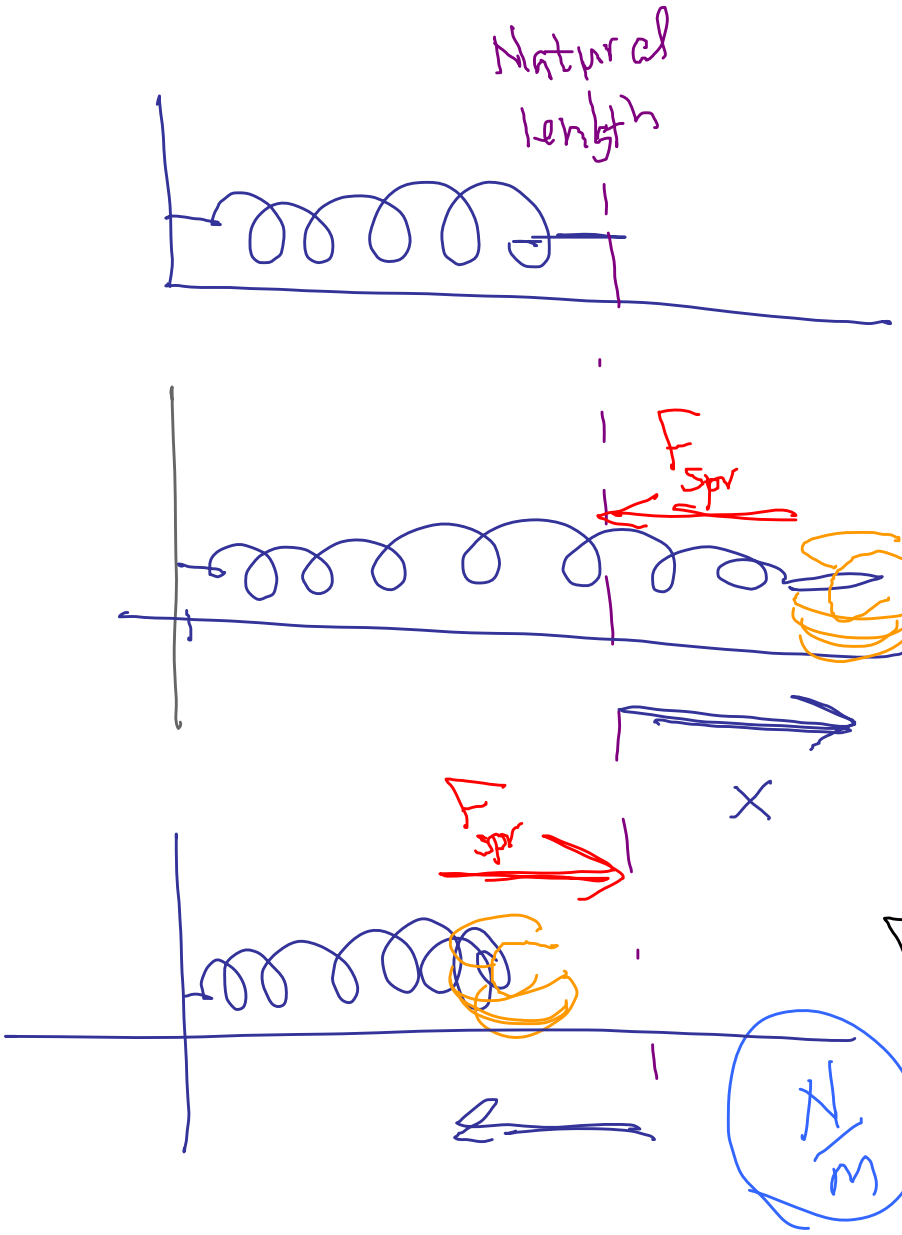

$F_{sp} \propto |x|$

Hooke's law

$F_{spr,x} = -kx$

spring constant
force constant