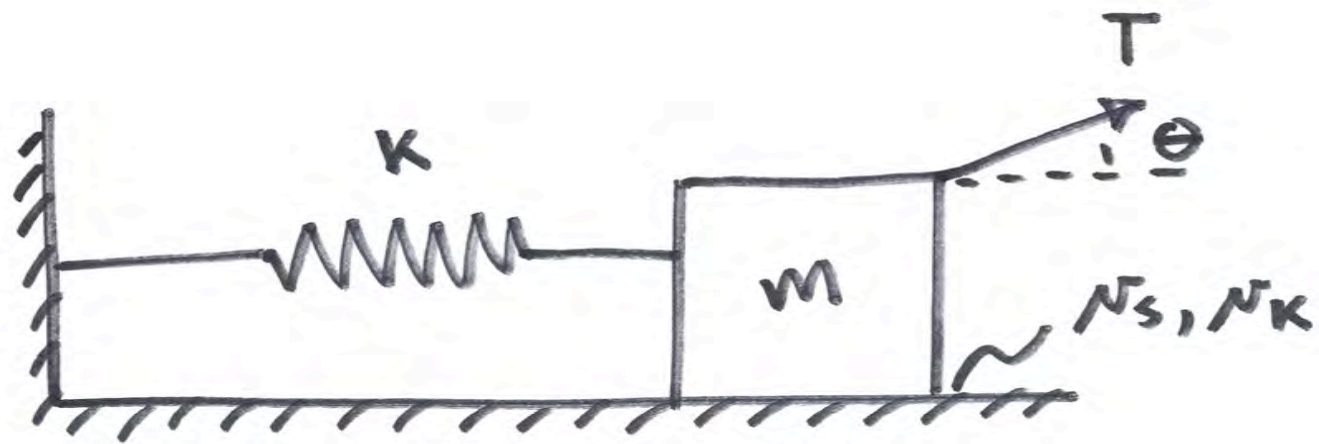
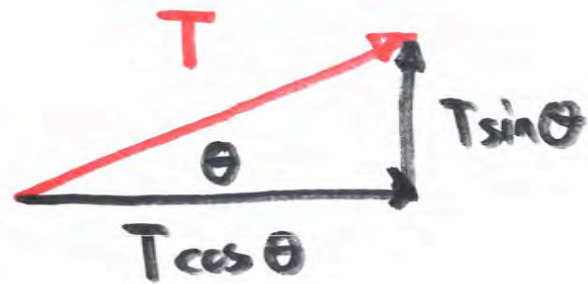
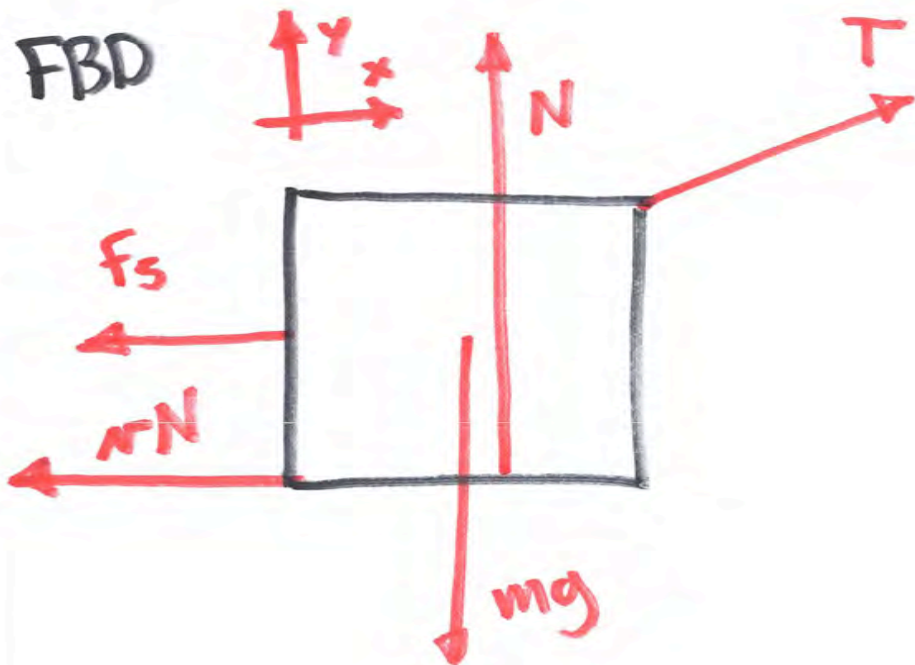


How far does the mass move?



$$\begin{aligned} T &= 500 \text{ N} \\ K &= 100 \text{ N/m} \\ m &= 100 \text{ kg} \\ \mu_s &= 0.3 \\ \mu_k &= 0.2 \\ \theta &= 10^\circ \end{aligned}$$



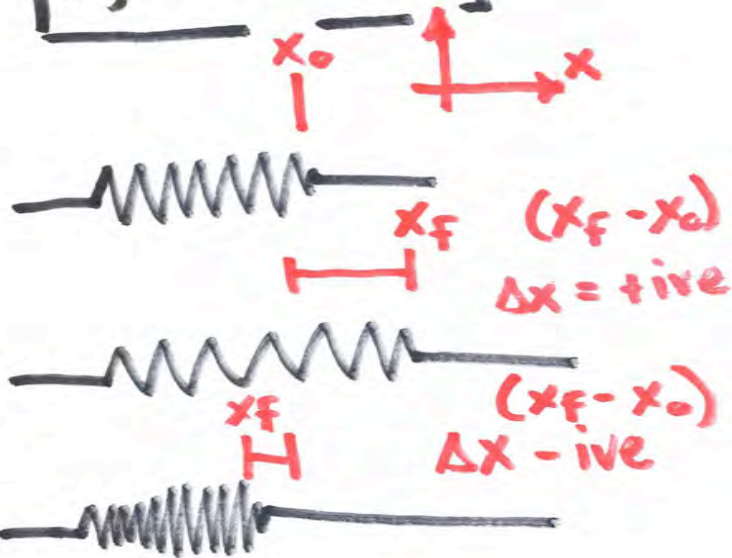
$$\sum F_x = m \cancel{a_x} = T \cos \theta + F_s - \mu N \quad (1)$$

$$\sum F_y = M \cancel{a_y} = N - mg + T \sin \theta \quad (2)$$

here

$$F_s = -k \Delta x$$

(3)



$$F_s = -k(+ive) = -ive$$

$$F_s = -k(-ive) = +ive$$

Sub (2),(3) into (1):

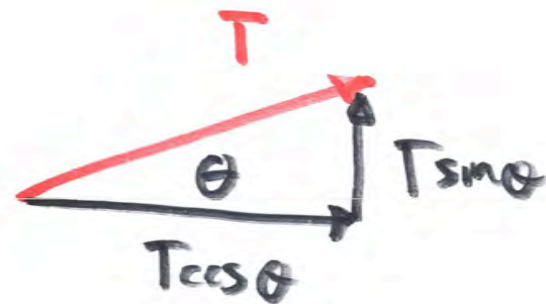
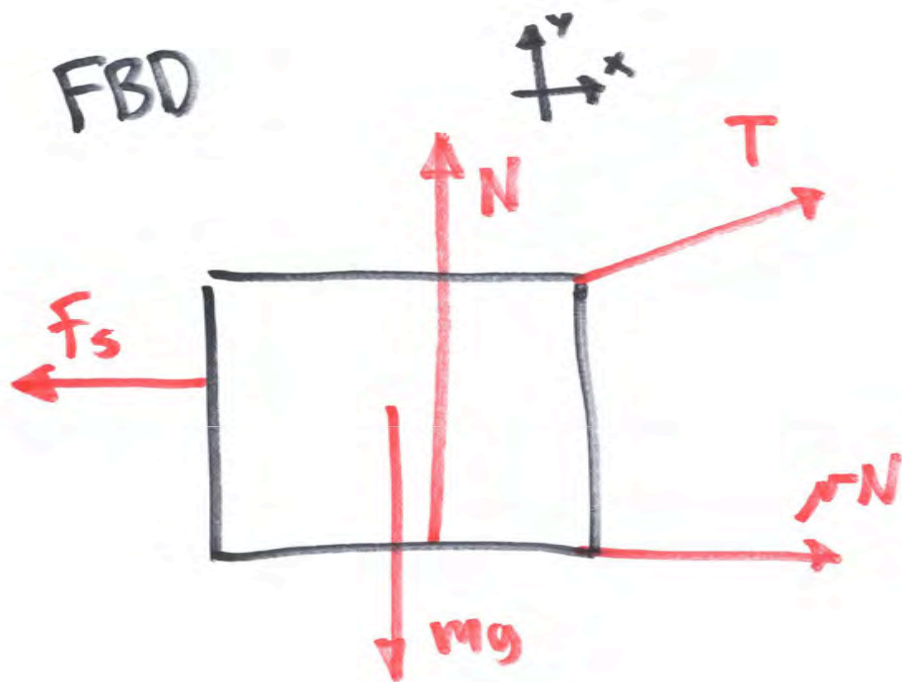
$$0 = T \cos \theta + (-k \Delta x) - \mu [mg - T \sin \theta]$$

$$\Delta x = \frac{1}{k} (-\mu mg + T \cos \theta + \mu T \sin \theta)$$

$$= \frac{1}{1000} (-(0.3)(100)(9.81) + 500 \cos(10) + (0.3)(500) \sin(10))$$

$$= 0.22 \text{ m}$$

FBD



$$\Sigma F_x = \cancel{ma_x} = T \cos \theta + \mu N + F_s \quad (1)$$

$$\Sigma F_y = \cancel{ma_y} = N - mg + T \sin \theta \quad (2)$$

$$F_s = -k \Delta x \quad (3)$$

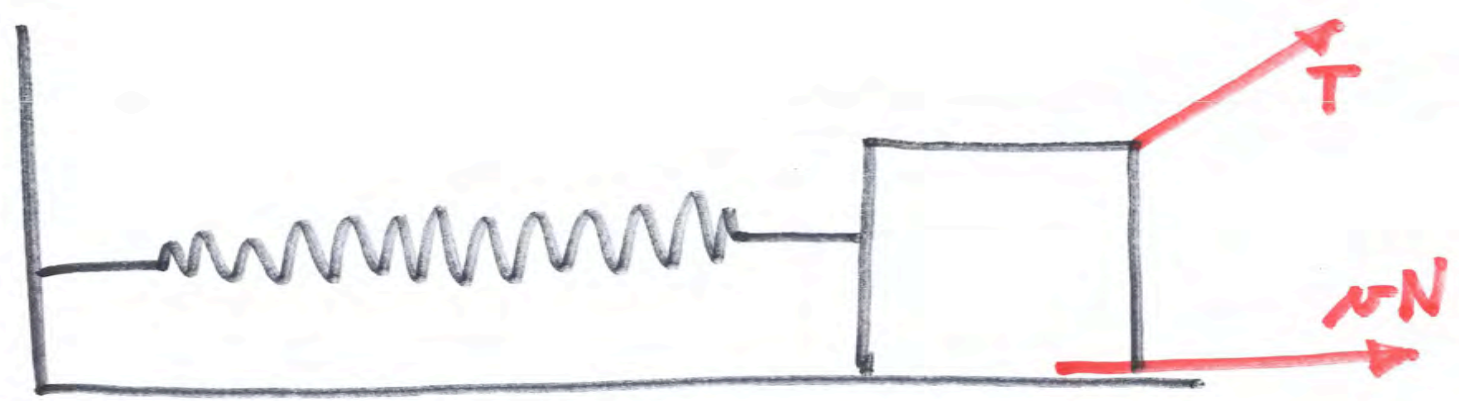
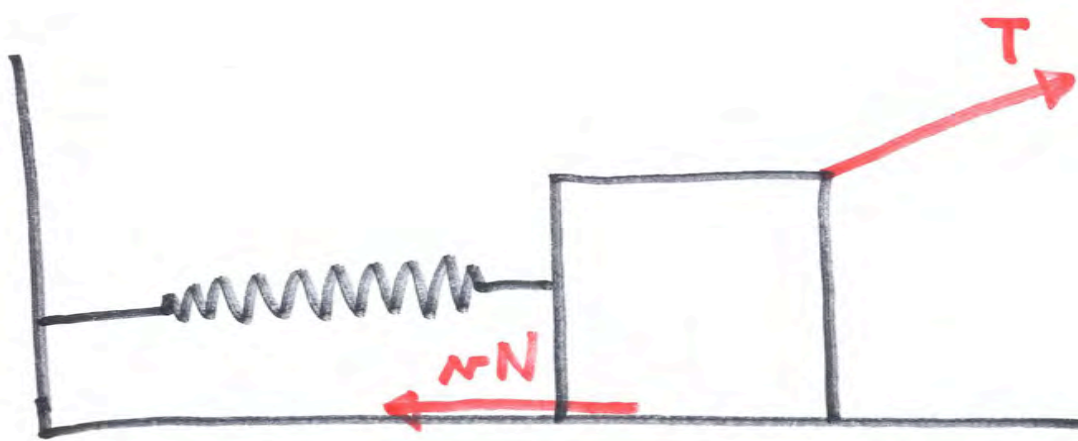
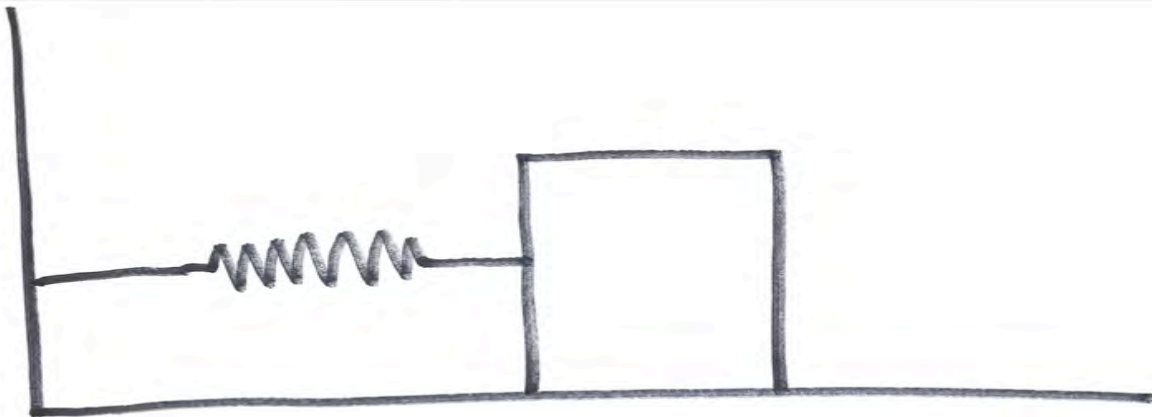
sub (2), (3) into (1)

$$0 = T \cos \theta + \mu [mg - T \sin \theta] + [-k \Delta x]$$

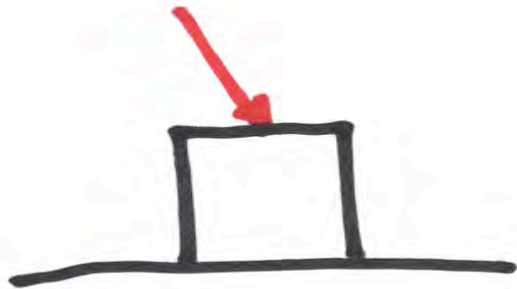
$$\Delta x = \frac{1}{k} (T \cos \theta + \mu mg - \mu T \sin \theta)$$

$$\Delta x = \frac{1}{1000} (500 \cos(10) + (0.3)(100)(9.81) - (0.3)(500) \sin(10))$$

$$\Delta x = 0.76 \text{ m}$$



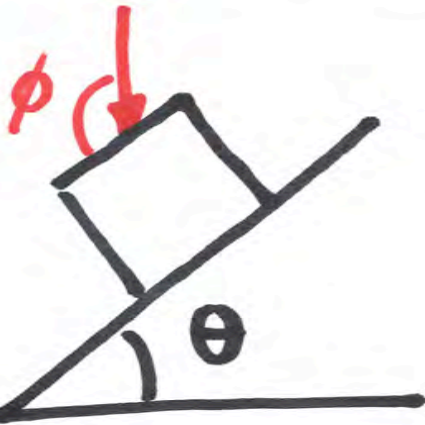
Quiz:



quiz 1:

N force
 a_x ?

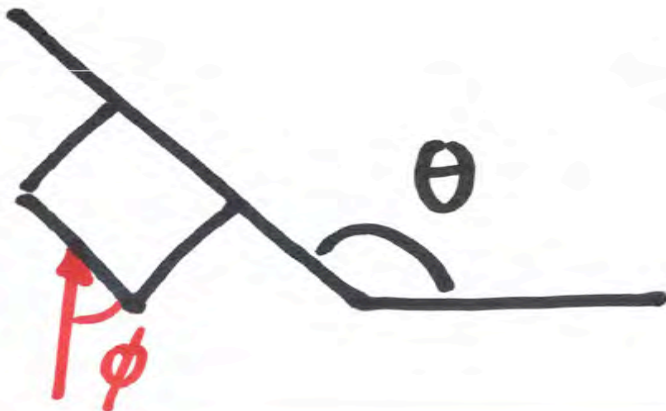
1



quiz 2:

N force
 a_x ?

2

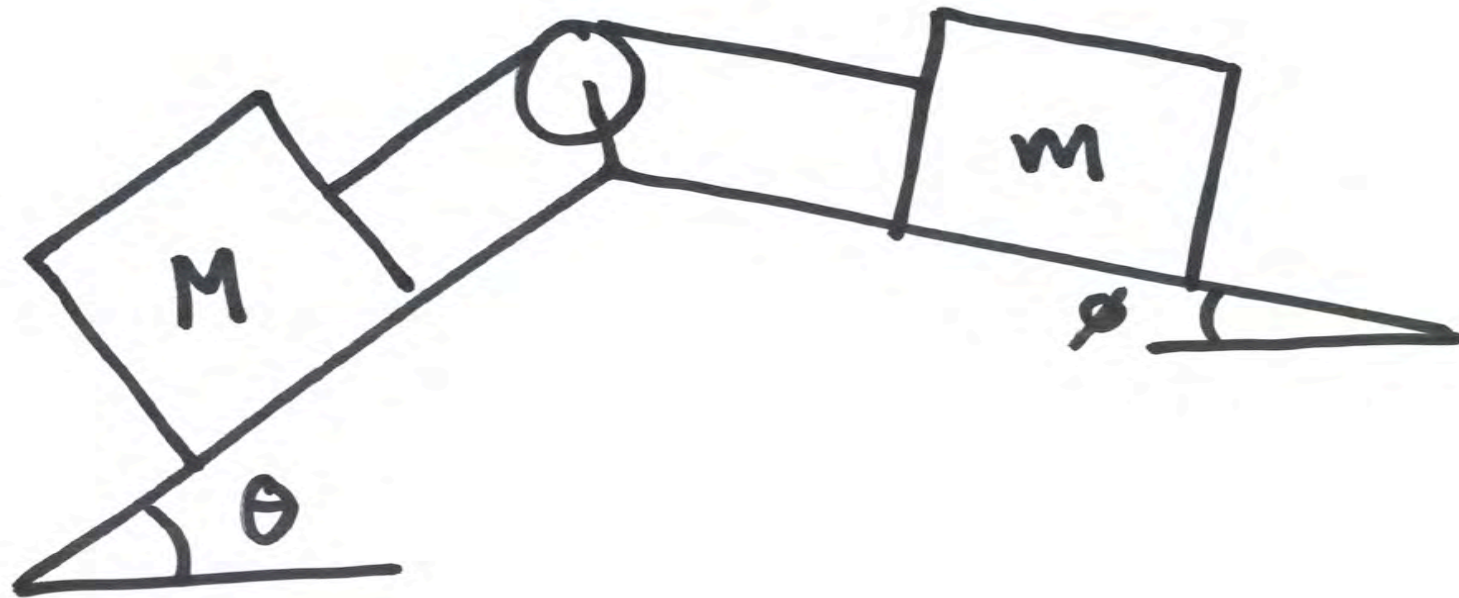


quiz 3:

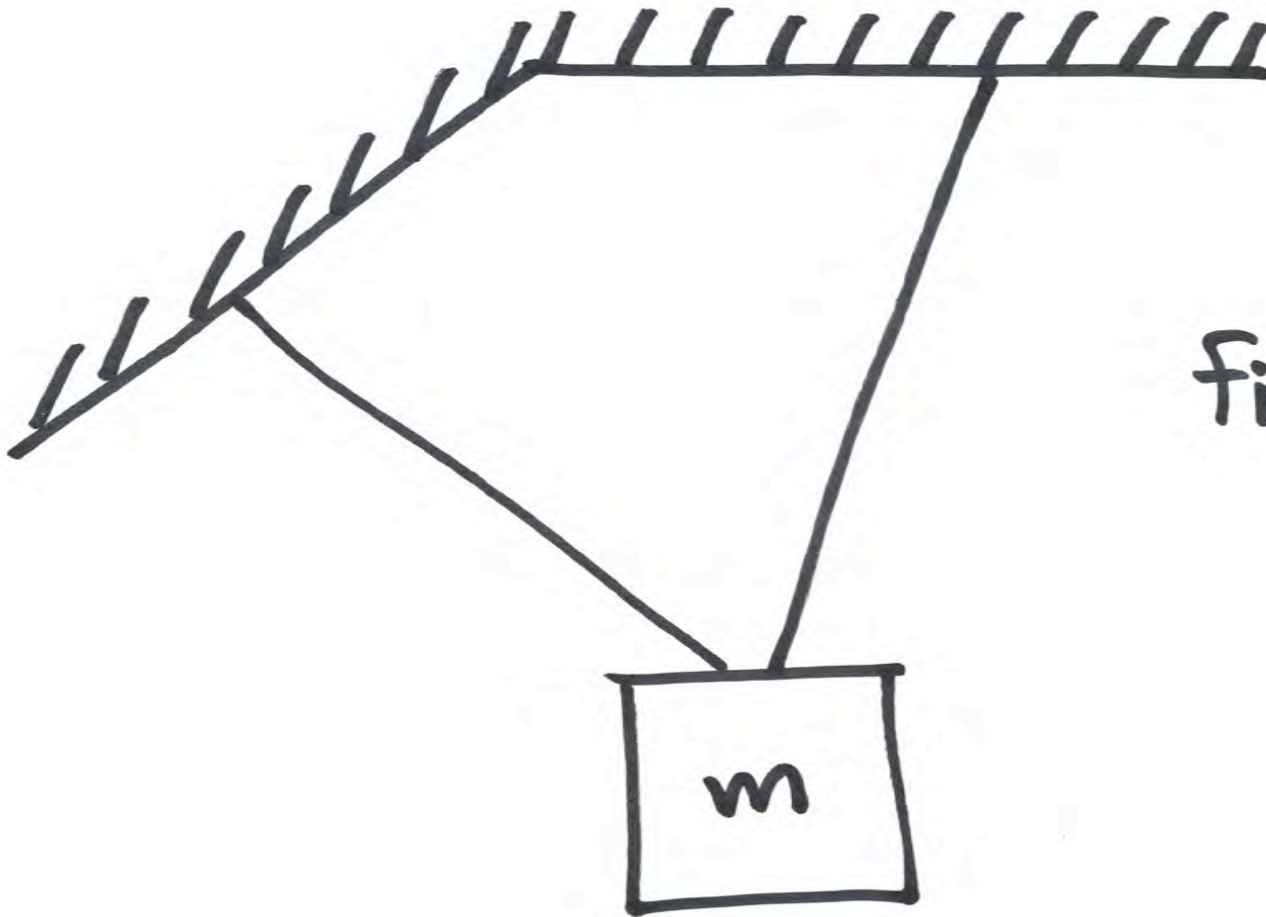
$F_{\min}$
 $F_{\max}$

2

Project:

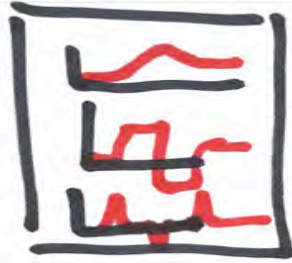


Quiz :



Except Test.

dva graph :



kinematic question :



dynamics (*2) :

