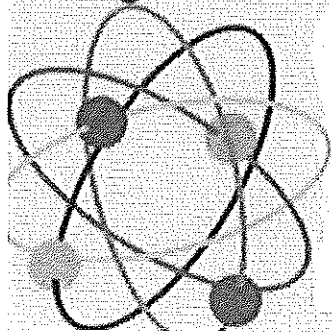


NYU Physics I

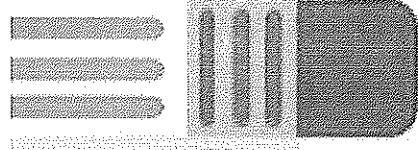
2018-10-18

- Term Exam 3.
ps 5,6.
etc...
- Questions.
- pendulum & spring

- Hooke's Law
- S.H.O.
- mass & spring
- pendulum
(simple).
- sine, cosine.



OSTEM X SPS (SOCIETY FOR PHYSICS
STUDENTS) PRESENT



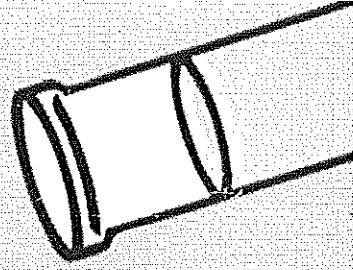
BEING LGBT+ IN RESEARCH

JOIN LGBT+ GRADUATE STUDENTS AND PROFESSORS
TO TALK ABOUT WHAT IT IS LIKE TO BE A QUEER
SCIENTIST. FOOD WILL BE SERVED! RSVP AND SUBMIT
ANY PANEL QUESTIONS YOU WOULD LIKE ANSWERED
IN THIS GOOGLE FORM:

[HTTPS://TINYURL.COM/Y7GLJSLR](https://tinyurl.com/y7gljslr)

THIS EVENT IS OPEN TO ALL NYU STUDENTS.

OCT. 23, 2018 | 7 PM
726 BROADWAY ROOM 940



Hooke's Law

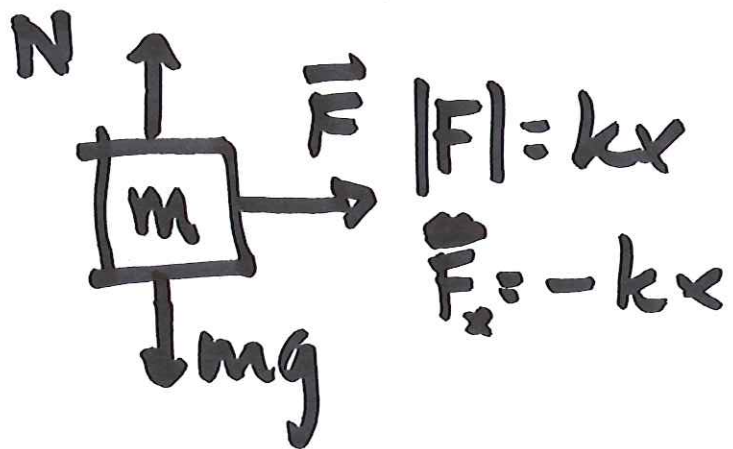
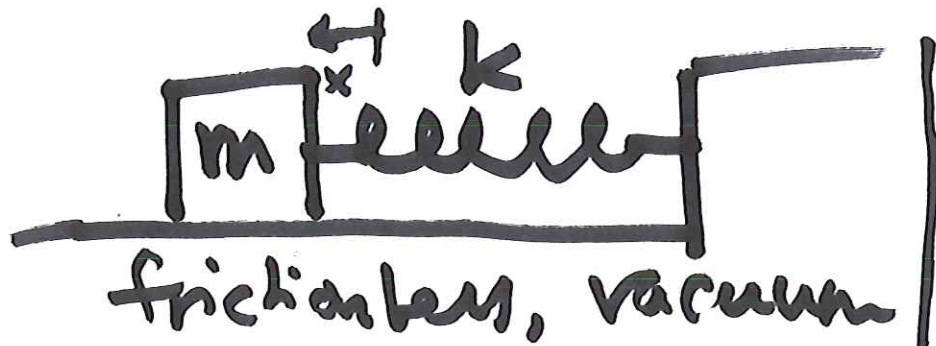
Stress is proportional to strain

modulus

$$\vec{F} = -k\vec{x}$$

stress: force / area $\frac{F}{A}$

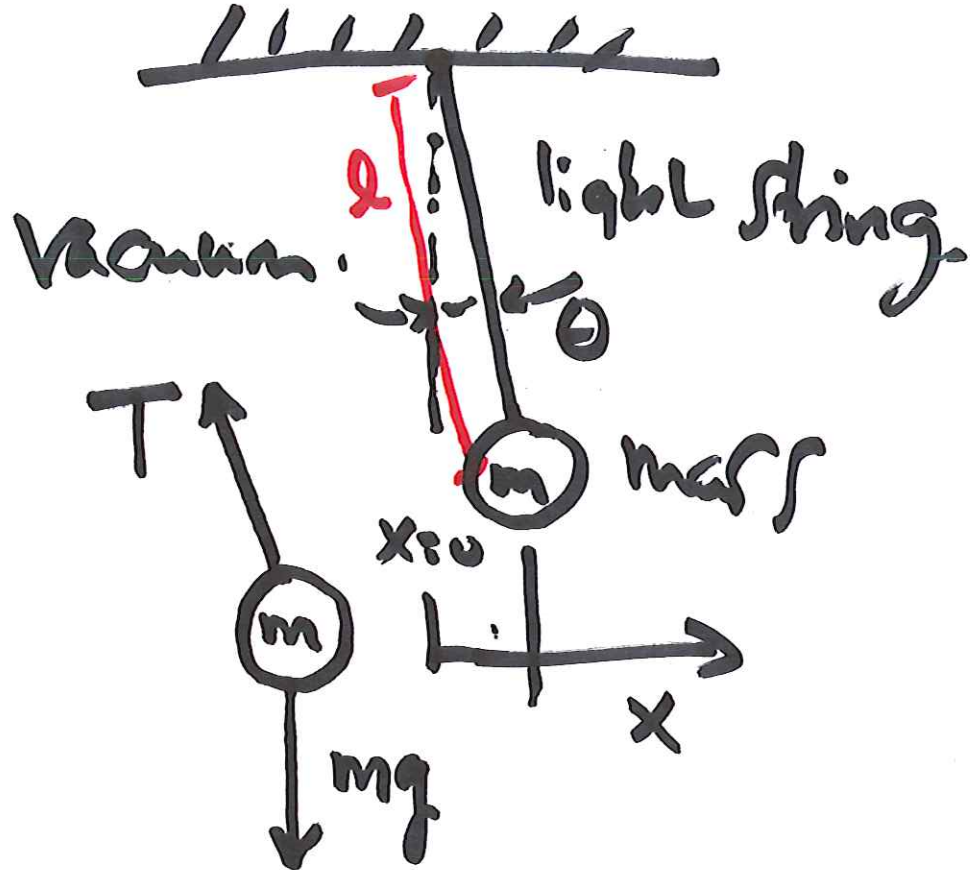
strain: dimensionless distortion
 $\frac{\Delta L}{L}$



$$ma_x = -kx$$

$$m \frac{dv_x}{dt} = -kx$$

$$m \frac{d^2x}{dt^2} + kx = 0$$



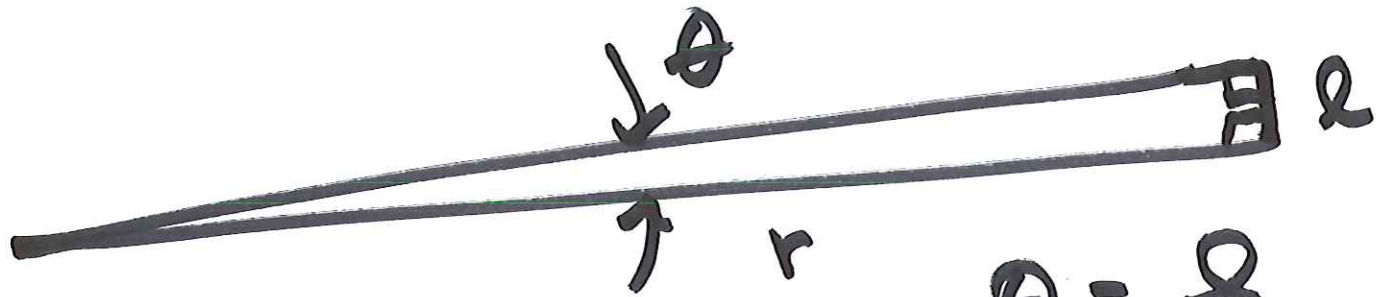
"Small-angle approx."

$$F_x = -T \sin \theta \approx -T \frac{x}{l}$$

$$T \approx mg$$

↑ s.a.a.

↑ s.a.a.

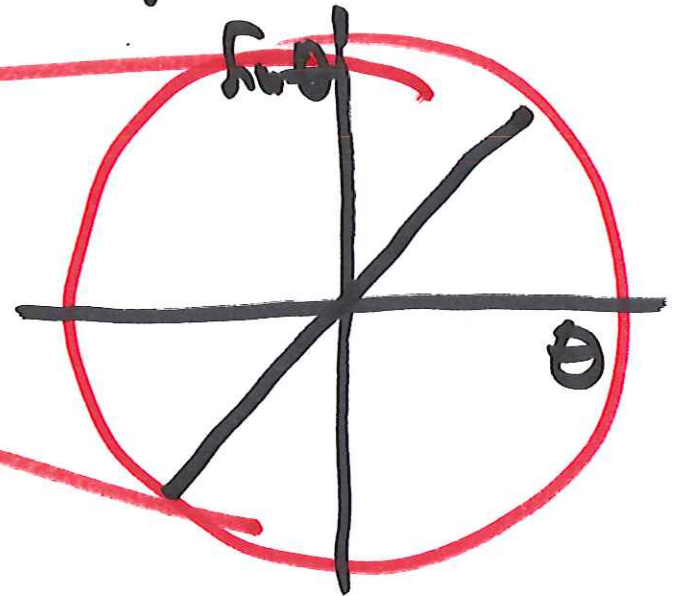
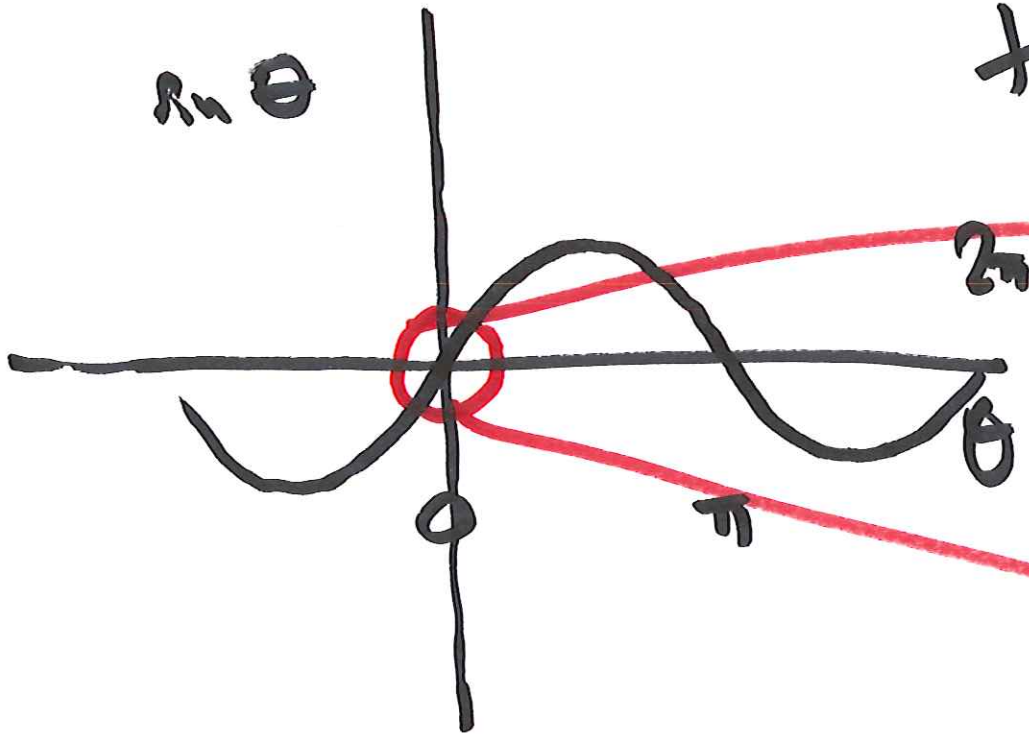


$$\theta = \arcsin \frac{2}{5}$$

$$\sin \theta = \frac{2}{5}$$

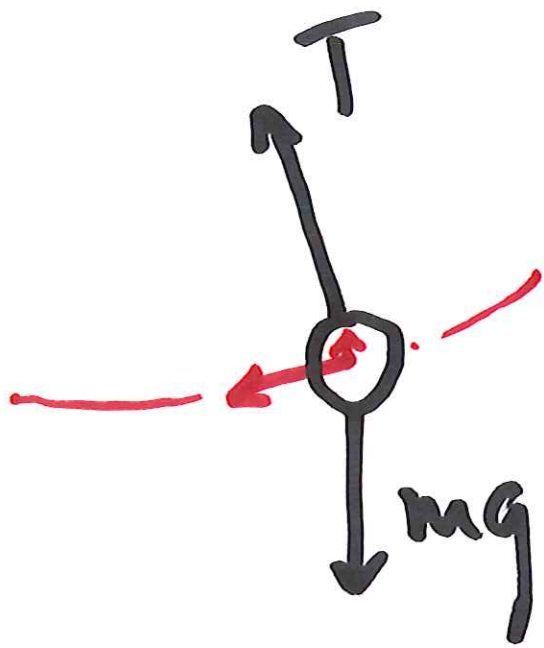
$$\tan \theta = \frac{2}{r}$$

$\sin \theta$



$$\sinh \theta = \theta - \frac{\theta^3}{3!} + \frac{\theta^5}{5!} - \frac{\theta^7}{7!} + \dots$$

$$\cosh \theta = 1 - \frac{\theta^2}{2!} + \frac{\theta^4}{4!} - \frac{\theta^6}{6!} + \dots$$



T : opposes ^{most of} gravity ($< mg$)
 : causes circular motion ($> mg$)

$$F_x \approx -T \frac{x}{l} \approx -mg \frac{x}{l}$$

$$m \frac{d^2 x}{dt^2} + mg \frac{x}{l} = 0$$

$$\boxed{\frac{d^2 x}{dt^2} + \frac{g}{l} x = 0}$$