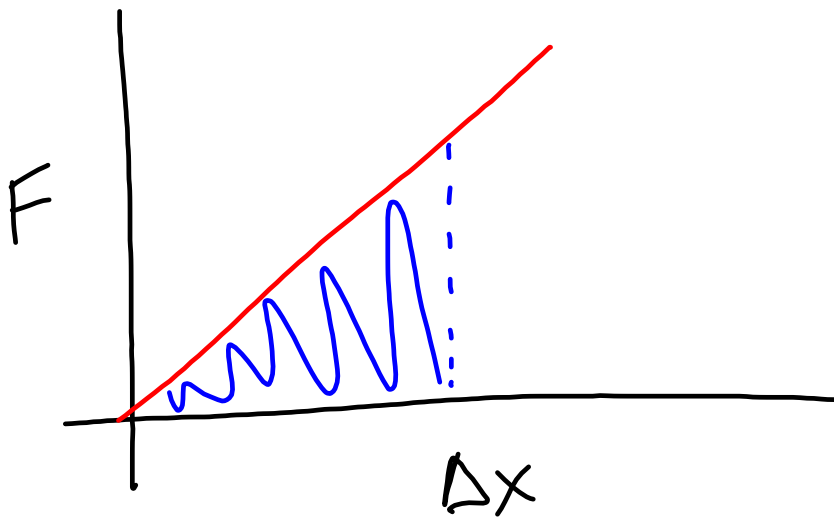


Lab - Springs

- Determine order of "springiness" of five springs → 3 data points for each spring
 - F vs. ΔX graph
 - Give physical meaning to the slope
 - Give physical meaning to area between function and x -axis
- relate these two



$$\text{slope} = \frac{F}{\Delta x} = k$$

↑ spring constant

$$F = -k\Delta x$$

↑
restoring
force

$$\left[\frac{N}{m} \right]$$

$$\text{area} = \frac{1}{2} F (\Delta x)$$

$$= \frac{1}{2} k (\Delta x) (\Delta x)$$

$$U_s = \frac{1}{2} k (\Delta x)^2$$

U → potential energy

s → spring

$$\frac{dU_s}{dx} = F_s \quad U_s = \int F_s dx$$

vectors! $\vec{F}_s = -k \Delta \vec{x}$

NO
vectors! $U_s = \frac{1}{2} k (\Delta x)^2$

Vectors \rightarrow +/- means a direction

Scalars \rightarrow +/- means increase/decrease

Unit for energy \rightarrow Joules

$$1 \text{ J} = 1 \frac{\text{kg} \cdot \text{m}^2}{\text{s}^2}$$