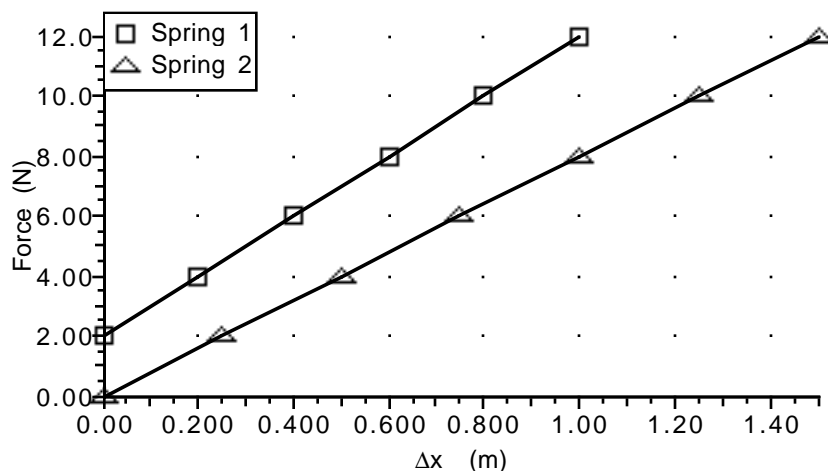


Unit VII: Review

The following data were collected for two springs:



Statistics:	Slope	Y Intercept	C.O.R.
Spring 1	$10.0 \pm 1.46E-18$	$2.00 \pm 8.85E-19$	1.00
Spring 2	8.00 ± 0.00	0.00 ± 0.00	1.00

1. What are the spring constants of springs 1 and 2?

2. How much elastic potential energy would be stored if spring 2 were stretched from 0 to 0.40 meters?

3. How much additional energy would spring 2 store if stretched from 0.40 to 0.80 m?

4. A 1000 kg car is traveling at a constant speed of 30 m/s.
 - a. How much energy is dissipated as the car comes to rest?

 - b. If the car stops in 100 meters, what is the average force applied to the car?

5. A 1.5 kg kitten jumps down from a 2.0 meter high fence.
- What is the kitten's \tilde{E}_g ?
 - What will be the kitten's speed when it reaches the ground?
6. A 50. g dart rests up against a spring that has been compressed 0.050 meters.
- If 1.25 J of work were required to compress the spring, what is its spring constant?
 - What is the maximum velocity of the dart after the spring has transferred its energy to it?
 - If the dart were fired vertically, what height would it reach?
 - Draw an energy bar graph for the above situation when the dart reaches a height of 1 m. Include a graph for both the initial ($y = 0\text{m}$) and final states.