Names:

Purpose: To determine the relationship between the work done on an object initially at rest and the resulting velocity.

Procedure:



- 1. Set up the track, cart and bars, motion detector and force probe as shown in the diagram. As always, make sure the track is level and that the cart is no closer than about 20 cm to the motion detector. Try to use a shorter string to connect the cart and force probe.
- 2. Open up Logger Pro and zero both the force probe and motion detector. This will set the initial position of the cart to zero in Logger Pro.
- 3. Hit the record button and then accelerate the cart by pulling on the force probe. Stop the cart before it crashes into the end of the track.
- 4. We need to ignore a lot of the data in Logger Pro. Highlight the portion of the data AFTER the force has gone to zero. Under "Edit" choose "Strike Through Data Cells". The numbers are still there, but Logger Pro will now ignore them.
- 5. Make a graph of Work vs Velocity. Create a new calculated column and use the function Integral ("Force", "Position").6. Linearize your W vs V graph. Paste both graphs into the space below.

Data & Graphs:

mass of cart & bars: _____ kg

Paste Graphs Here

Questions:

- 1. What was your linearized equation that relates velocity to work?
- 2. Reduce the units of the slope. What could be the physical significance to the slope?
- 3. How did you calculate the work done?
- 4. Why do you think we asked you to "strike through" some of the numbers instead of just ignoring like we always do? Talk it over in your group, then re-enable all the data, and look at your graphs to see why.