Purpose: In this lab we will experimentally determine the fundamental properties of uniformly accelerated motion by using a ticker-tape time to analyze the motion of a cart down an incline plane.

Equipment:

- A spool of ticker tape
- 1 ticker tape timer with carbon disk
- 1 power supply
- 1 ramp
- 1 lab cart
- 1 ruler

Procedure:

1. Thread the ticker tape through the two "guide staples" in the ticker tape timer, making sure that it passes underneath the carbon disk. The carbon disk should have its "ink side" down so that a mark will be made on the ticker tape each time the timer's rotating bead strikes it.
2. Attach one end of the tape to the lab cart and leave the other end free to slide through the timer.
3. Let the timer run and leave a preliminary "ink blob" of dots to mark the beginning of your experiment before releasing the cart.
4. As the cart rolls down the incline, it will pull the ticker tape through the timer leaving a set of "dots" along the backside of the tape.
5. Immediately turn off the power supply once the cart reaches the bottom of the incline.
6. Before allowing the next group to use the equipment, make sure that you can clearly see the dots on your ticker tape. If there is an error; complete another trial.

Data Charts:

1. Starting at the beginning of your tape, count the first 10 "discernible" dots - circling #10. Then count the next 10 dots, circling #20. Continue counting until you are done with all of the dots.
2. Measure the length of each 10-dot section and record their values as your cart's displacement during each interval.
3. For the purpose of this experiment, we will assume that your timer had a frequency of 60 hz. This means that each of your 10-dot sections represents 0.1 seconds.

Analysis:

1. Complete a chart of time in intervals of 0.1 seconds and distance in 10-dot intervals.
2. Graph this information on a distance-time graph.
3. Use tangents at 5 different points to determine instantaneous velocity.

Conclusions:

1. Use your velocity calculations to determine the acceleration of the cart.