1. (1 pt.) What is the formula for the acceleration of an object on a frictionless inclined plane with inclination angle $\theta$ and acceleration due to gravity $g$?

2. (1 pt.) How many calculations of $g$ will we have by the end of the experiment?

3. (1 pt.) How much should $\chi^2$ change to have a generous estimate of the uncertainty in $g$?

4. (1 pt.) In the spreadsheet, what is the formula used to calculate the inclination angle? Why?

5. (1 pt.) Why does the spreadsheet provide space to enter a Record of Fits?

6. (3 pts.) If $y(t)$ is a parabola of the form

   $$y(t) = \frac{1}{2}(g \sin \theta)t^2 + v_0 t + y_0,$$

   and $x(t) = v_0 t + x_0$, show by direct substitution that the trajectory $y(x)$ is a parabola with the same form of $y(t)$, the standard equation for projectile motion.
7. (6 pts.) The air table has approximate dimensions of 25 cm × 25 cm. If the table is set up as in the first part of the experiment, where the incline has a rise of 1 cm over the 25 cm length, what is the maximum velocity up the slope that a puck may have and not hit the upper wall?

8. (6 pts.) The following image shows two measurements taken for calculating the inclination angle of an air table (the scale is in inches). The reading on the first image is when the micrometer peg is flush with the base of the micrometer, and the reading on the second image was taken when the micrometer is level. Calculate the extension of the micrometer peg from the micrometer base. If the length of the micrometer base is 6.545 inches, what is the inclination angle?

9. (5 pts.) For good data, the inclination angle should be chosen so that the time for a puck to go up the slope about 20 cm and back provides a good number of frames, perhaps one second. What angle should be chosen to achieve this? Note: this is not the same inclined plane as in question 7! Do not assume the inclination angles are the same!