EN PHYS 131 - EZ02- Lab 9

Due Mon. Mar. 21 @ 5 PM

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Procedure:

1. Setup LoggerPro to work with the Smart-Pulley. Download the template from eClass. Adjust the height of the pulley so the mass can fall about 1 metre.
2. Release the mass starting with 200 g (the hangar is 50 g) while collecting data with LoggerPro. Stop the data collection before the mass hits the floor.
3. Fit a line to the data you collected. Record the slope of the line - this gives you the linear acceleration.
4. Repeat 2 and 3 increasing the mass each time by 50 g, up to 600 g. Record the linear acceleration for each trial.
5. Form a linear equation with Eq. 6. Use your linear acceleration and mass values to determine I and the torque from friction.
6. Use the results from your fit to determine the force of friction on the axle and the mass of the wheel.
7. Measure the radius of the wheel and the hub.

$$rm(g-a) = I\frac{a}{r} + \tau_f$$

$$I = MR^2 \quad \tau_f = \mathrm{F}_f r_{\mathrm{axle}}$$

In report:

- Velocity graph for the first run (with 200 g).
- Show how Eq. 6 can be re-arranged to find I and torque due to friction.
- Fit of the re-arranged Eq. 6 with the acceleration and mass values.
- Value for the mass of the wheel and force of friction, with errors.
- Compare to the mass value given in the manual