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Centripetal Force Lab

Instructions: work in groups of three or four and submit a single copy to be graded.

Requirements:

1. Draw and complete free body diagrams for the cork and washers in the drawings below.

Cork

θ

Washers

1. Explain why the string holding the cork cannot be exactly horizontal (θ ≠ 0) with reference to the free body diagram.
2. Determine the mass of the washers and calculate their weight. (Hint: you must have consistent units.)
3. You will need to determine the centripetal force of the cork.
   1. Make a list of the equations required.
   2. Make a list of the measurements required.
   3. Take data and record measurements.
   4. Show calculations and results for the period, speed, acceleration, and centripetal force of the cork.
4. Explain why the centripetal force of the cork is not equal to the weight of the washers. Explain with reference to the free body diagram.
5. Calculate the percent error (take the weight of the washers as the actual force). If your percent error is greater than 15% there is either an error in your calculations or poor data. You must correct the problem or repeat with new data until you obtain acceptable results.