NAME _____   DATE _____

Scenario

A bicycle wheel is mounted on a horizontal axle as shown in the diagram. Angela is first tasked with finding the torque that is applied to the wheel by the force of friction at the axle. She is not able to remove the wheel from its bearings or change the orientation of the axle but does have access to materials commonly found in a school physics laboratory.

PART A: Explain how Angela can calculate the frictional torque applied to the wheel. State what apparatus is to be used, what measurements are to be made, and what calculations must be done to obtain a value for the frictional torque.

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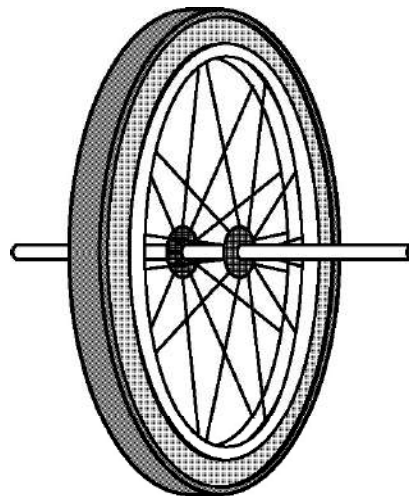
Upon finding a significant frictional torque, Angela drips oil on the axle. She supposes that the bearings now exert negligible friction and wishes to determine the rotational inertia of the wheel.

PART B: Briefly explain what Angela can do to show that the wheel's axle bearings now exert negligible friction.

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PART C: Explain how Angela can calculate the rotational inertia of the wheel. State what apparatus is to be used, what measurements are to be made, and what calculations must be done to obtain a value for the rotational inertia.