# Lab 12: Rotational Motion

Pre-Lab

Consider a disk on frictionless bearings. On top of the disk (concentric) is a spool with string wrapped around it; the spool is rigidly attached to the metal disk and will freely rotate if the disk rotates. The string goes over a pulley and to a load mass (see the below illustration).
Assume that the metal disk has a radius of 5.00cm, the metal spool has a radius of 2.50cm, and the load mass is 0.100 kg.

Metal
Spool

Metal
Disk

Frictionless
Pulley

Frictionless
Bearings

m
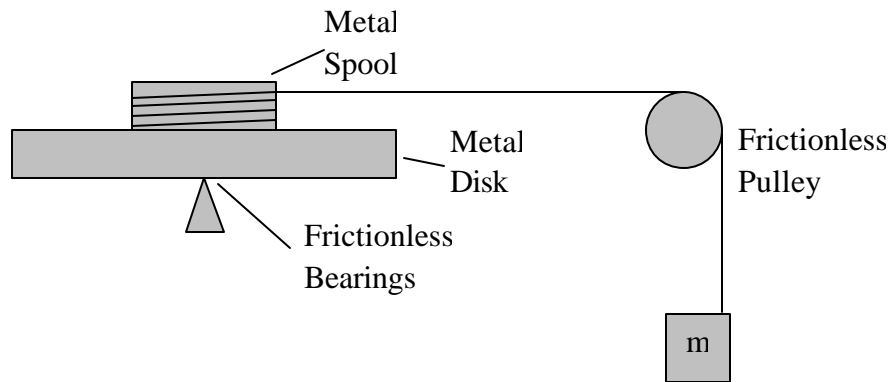
1) Through measurements it is found that the outside edge of the metal disk has a tangential acceleration of 2.50 m/s^2. What would be the acceleration on the load mass? Show all of your work and/or explain your thinking.

2) Using the above values, determine the tension in the string. (Hint: the answer is NOT 0.98N).
Show all of your work and/or explain your thinking.

3) Determine the torque acting on the disk/spool combination. Show all of your work and/or explain your thinking.