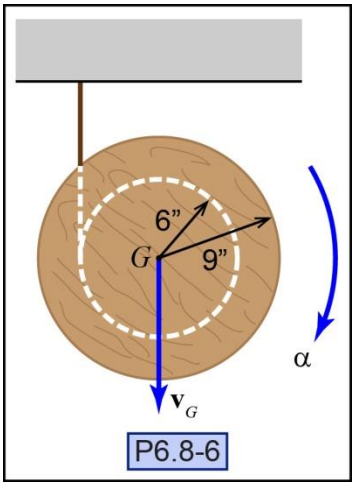
P6.8-6) The 20-lb spool shown is hung by the ceiling with a rope that wraps around its inner radius. The spool is released from rest. Find the angular acceleration of the spool if it has a radius of gyration about its mass center of 4 in. Assume that the rope remains vertical and it unwinds without slipping.

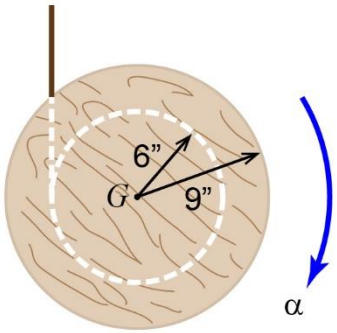


Given:

Find:

Solution:

Draw a free-body diagram of the spool.



Calculate the spool's mass moment of inertia.

What is your reference point?

I = _____

Use the spools equation of motion to determine the angular acceleration.

α = _____