Homework #14

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1 Problem 1

A wheel, whose moment of inertia is 0.0300 $\mathrm{kg} * \mathrm{m}^2$, is accelerated from rest to 20.0 rad/s in 5.00 s. When the external torque is removed, the wheel stops in 1 min. Find: (a) the frictional torque; (b) the external torque.

1.1 Solution

2 Problem 2

A block of mass m = 2.00 kg hangs vertically from a frictionless pulley of mass M = 4.00 kg and radius R = 15.0 cm. Find: (a) the acceleration of the block; (b) the tension in the rope; (c) the speed of the block after it has fallen 40.0 cm—assuming it started at rest. Treat the pulley as a solid disk.

2.1 Solution

3 Problem 3

A block of mass m = 2.00 kg can slide down a frictionless 53° incline, but it is connected to a pulley of mass M = 4.00 kg and radius R = 0.500 m, as shown in the figure below. The pulley can be treated as a disk. Find: (a) the angular acceleration of the pulley; (b) the speed of the block after it has slid 1.00 m, starting from rest.

3.1 Solution

4 Problem 4

4.1 Solution

5 Problem 5

5.1 Solution

6 Problem 6

6.1 Solution

7 Problem 7

7.1 Solution

8 Problem 8

8.1 Solution