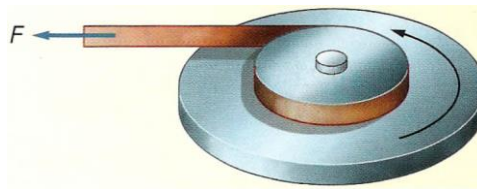


- 1) A bicycle wheel on a repair bench can be accelerated either by pulling on the chain that is on the gear or by pulling on a string wrapped around the tire. The tire's radius is 0.38 m, while the radius of the gear is 0.14 m. What force would you need to pull the string to produce the same acceleration you would with a force of 16 N on the chain? [8-27]
- 2) CHALLENGE A disk with a moment of inertia of $0.38 \text{ kg}\cdot\text{m}^2$ is attached to a smaller disk mounted on the same axle. The smaller disk has a diameter of 0.18 m and a mass of 2.50 kg. A strap is wrapped around the smaller disk, as shown in **Figure 14**. Find the force needed to give this system an angular acceleration of 3.20 rad/s^2 . [8-30]



- 3) Basketball A basketball is rolled down the court. A regulation basketball has a diameter of 24.0 cm, a mass of 0.625 kg, and a moment of inertia of $5.79\text{E-}3 \text{ kg}\cdot\text{m}^2$. The basketball's initial velocity is 2.20 m/s. [8-93]
- What is its initial angular velocity?
 - The ball rolls a total of 10 m. How many revolutions does it make?
 - What is its total angular displacement?
- 4) **Newton's Second Law for Rotation:** A rope is wrapped around a pulley and pulled with a force of 14.0 N. The pulley's radius is 0.16 m. The pulley's rotational speed increases from 0.0 to 15.0 rev/min in 4.50 s. What is the moment of inertia of the pulley? [8-36]

- 5) Zoe (45 kg) and Emma (53 kg) want to balance on a 7.20 m seesaw. Where should they place the pivot (fulcrum) if the seesaw has a mass of 30.0 kg?
- 6) If a 34.0 Nm torque on a wheel causes an angular acceleration of 22.0 rad/s^2 , what is the wheel's rotational inertia?
- 7) A drum rotates around its central axis at an angular velocity of 12.22 rad/s . If the drum, then slows at a constant rate of 4.46 rad/s^2 .
- How much time does it take to stop?
 - through what angle does it rotate in coming to rest?
- 8) A weight of 623N is suspended on a hinged uniform rod of 600N. A wire is holding the rod level and it is attached above the rod and makes an angle of 47° .
- Draw and label the FBD
 - Find the tension in the wire, T
 - Find F_{hy}
 - Find F_{hx}