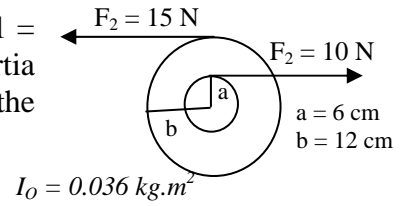


Chapter 11 (Rotation)

1- A disk of radius 20 cm rotating at 42 rad/sec stops (assume constant deceleration) after 10 sec. Through how many radians does the disk turn during this time? (A: 210 rad)

2- A disk is rotating about an axel through its center O when two forces $F_1 = 10\text{ N}$ and $F_2 = 15\text{ N}$ are applied on it as shown in Fig. The moment of inertia of the disk about O is $0.036\text{ kg}\cdot\text{m}^2$. If the system starts from rest, find the angular speed at time = 3.0 s. (A: 100 rad/s)



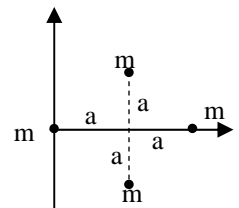
3- A torque of 80 N.m applied to a pulley increases its angular speed from 45 rev/min to 180 rev/min in 3 seconds. Find the moment of inertia of the pulley?

4- A wheel has a moment of inertia $12\text{ kg}\cdot\text{m}^2$ about its axis of rotation. As it turns through 5.0 rev, its angular velocity increases from 5.0 rad/s to 6.0 rad/s. If the net torque about the axis of rotation is constant, its value is: (A: 2.1 N*m)

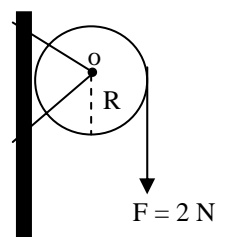
5- A disk has a moment of inertia $6.0\text{ kg}\cdot\text{m}^2$ about a fixed axis of rotation. It has a constant angular acceleration of 2.0 rad/s^2 . If it starts from rest, the work done during the first 5.0 s by the net torque on it is: (A: 300 J)

6- A wheel, starting from rest, turns through 8.0 revolutions in a time interval of 17 s. Assuming constant angular acceleration, what is the angular speed of the wheel at the end of this time interval? (A: 5.9 rad/s)

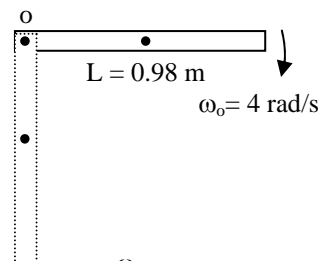
7- Four identical particles, each with mass m , are arranged in the xy plane as shown in figure. They are connected by light rods to form a rigid body. If $m=2.0\text{ kg}$ and $a=1.0\text{ m}$, the moment of inertia of this system about the y -axis is: (A: $12\text{ kg}\cdot\text{m}^2$)



8- A wheel with a moment of inertia of $5.0\text{ kg}\cdot\text{m}^2$ and a radius of 0.25 m rotates about a fixed axis perpendicular to the wheel and through its center as shown in figure 10. A force of 2.0 N is applied tangentially to the rim. As the wheel rotates through one revolution, what is the work done by the force? (A: 3.14 J)



9 - A uniform rod of length $L=0.98\text{ m}$ and mass $M=3.0\text{ kg}$ is free to rotate on a frictionless pin through one end (See Fig). The rod has an angular speed of 4.0 rad/s when it was in the horizontal position. What is the angular speed at its lowest position? (A: 6.8 rad/s)



10- The four particles in Fig (6) are connected by rigid rods of negligible mass. Calculate the moment of inertia of this system about the x axis. (A: $63\text{ kg}\cdot\text{m}^2$)

