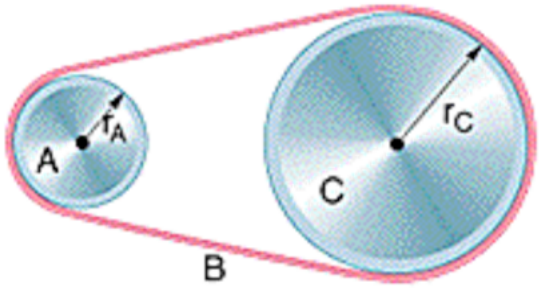
1. **A drum rotates around its central axis at an angular velocity of 11.20 [rad/s]. Assume that the drum then slows at a constant rate of 4.60 [rad/s^2].**
   a. **How much time is required for it to come to rest?**
   b. **Through what angle does it rotate as it comes to rest?**

2. **Starting from rest, a disk rotates about its central axis with constant angular acceleration of 1.39 [rad/s^2]. In 6.0 [s], it rotates 25 [rad].**
   a. **What is the angular velocity of the disk at the end of the 6.0 [s]?**
   b. **Assuming that the acceleration does not change, through what additional angle will the disk turn during the next 12.0 [s]?**
   c. **What is the total angular displacement over the total 18 [s] interval?**

3. **In the figure below, wheel A of radius r_A = 13 [cm] is coupled by belt B to wheel C of radius r_C = 20 [cm]. The angular speed of wheel A is increased from rest at a constant rate of 1.6 [rad/s^2]. Find the time needed for wheel C to reach an angular speed of 12.56 [rad/s], assuming the belt does not slip.**



4. **The acceleration of an oscillating object is a(t) = 2cos(2t) [m/s^2]. What is the change in the velocity of the object from time 4 [s] to 8 [s]?**

AP FRQs

5. 2015 #2

6. 2002 #3

Extra Problems

E1. The angular position of a point on a rotating wheel is given by $\theta = 3 + 3t^2 + 8t^3$, where θ is in radians and t is in seconds.

- **a. At t = 0, what is the point's angular position?**
- **b. At t = 0, what is the point's angular velocity?**
- **c. What is the point's angular velocity at t = 4 [s]?**
- **d. Calculate the point's angular acceleration at t = 2.0 [s].**
- **e. Is the angular acceleration constant?**

1a. 2.43 [s]
1b. 13.6 [rad]

2a. 8.34 [rad/s]
2b. 200.16 [rad]
2c. 225.16 [rad]

3. 12.1 [s]

4. -1.277 [m/s^2]

5. Will review in class

6. Will review in class

Extra Problems

E1 a. 3 [rad]
E1 b. 0 [rad/s]
E1 c. 408 [rad/s]
E1 d. 102 [rad/s^2]
E1 e. No, since the second derivative of $\theta(t)$ is $\alpha(t) = 48t$ and is time dependent.