

Rotation Problems I

- A wheel starts from rest and has a constant angular acceleration of 3.5 rad/s^2 .
 - After 30 seconds, what is its angular velocity?

 - After 30 seconds, what is its angular position?

- A rotating disc has an initial angular velocity of 120 rad/s . It slows to a stop in 3 minutes.
 - What was its angular acceleration?

 - What was its angular displacement during this time? (What is its final angular position?)

 - What was its initial angular velocity, in rpm?

- A rotating flywheel has an initial angular velocity of 25 rad/s . It undergoes a constant angular acceleration, and after 4 complete revolutions, it has a final angular velocity of 40 rad/s .
 - How long did it take to do these revolutions?

 - What was the angular acceleration?

- A wheel has an initial angular velocity of 45 rpm . It slows down at a constant rate. After 30 seconds, it has covered an angular displacement of 90 radians. (Careful of units!)
 - What was the final angular velocity?

 - What was the angular acceleration?

 - How much longer until the wheel stops?

Answers: 1. a) 105 rad/s b) 1575 rad 2. a) -0.67 rad/s^2 b) $10,800 \text{ rad}$ c) 1146 rpm
 3. a) 0.77 s b) 19.4 rad/s^2 4. a) 1.3 rad/s b) -0.113 rad/s^2 c) 11.5 s