

Honors Physics – Ch. 7 Rotation problems – 02-23-11

1. Express the following in degrees, radians, and revolutions. (a) 20° (b) 0.40 rad (c) $1/3 \text{ rev}$
2. Express the following angular speeds in radians per second and revolutions per second. (a) 0.020 rev/s (b) $30^\circ/\text{s}$ (c) 1.4 rad/s
3. A flywheel at rest is to reach an angular velocity of 36 rad/s in 6.0 s . (a) What constant angular acceleration is needed? (b) What total angle does it turn through?
4. A wheel turning with angular speed of 5.25 rad/s is brought to rest at a constant angular acceleration. It turns 375 radians while stopping. (a) What is its angular acceleration? (b) What time does it take to stop?
5. A spinning wheel has an angular velocity of 50 rad/s and 20 s later it has an angular velocity of -50 rad/s . If the angular acceleration is constant, what are (a) the angular acceleration (b) the angular displacement (c) the angular speed at 30 s ?
6. A turntable rotating at 8.16 rad/s slows uniformly to a stop in 0.95 revolutions . Find the angular acceleration.
7. Using $s = r\theta$, (a) How many radians must a 60 cm car tire turn if the car travels 2.5 km . (b) How many revolutions does the tire make?
8. In 7 s a car accelerates uniformly from rest to such a speed that its wheels are turning at the rate of 1.25 rev/s . (a) What is the angular acceleration of a wheel? (b) Through how many revolutions does the wheel turn?
9. Two gears that are meshed together have radii of 0.50 and 0.15 cm . Through how many radians does the small one turn when the larger turns through 20 radians ?
10. A car accelerates uniformly from rest to a speed of 15 m/s in 20 s . The radius of the car wheel is 0.33 m . Find (a) the angular acceleration of one of its wheels (b) the number of radians it turns through and (c) the number of revolutions it makes.