Phys 2010 (NSCC), Spring 2007
Problem Set #8

1. Convert 8.5 radians to: (a) Revolutions. (b) Degrees.

2. If a rotating object has a constant angular velocity of $8.17 \frac{\text{rad}}{\text{s}}$, how many *revolutions* does it make in one minute?

3. A wheel starts rotating from rest and undergoes a constant angular acceleration. In 10.0 s it makes 50.0 revolutions. What is the angular acceleration of the wheel?

4. In problem 3, what was the angular velocity at the end of the 10.0 s?

5. An object is rotating at a rate of $130 \frac{\text{rad}}{\text{s}}$. It undergoes a constant angular deceleration and comes to rest in 12.0 s.

What is the magnitude of the angular acceleration of the object? How many turns did it make in coming to a halt?

6. A wheel of radius 46.0 cm is turning at a rate of $90.0 \frac{\text{rev}}{\text{min}}$. What is the speed of a point on its rim?

7. A motorcyle is traveling at a speed of $25.0\,\frac{\text{m}}{\text{s}}$ has wheels of radius 30.0 cm. What is the angular velocity of its wheels?

    If the motorcycle decelerates uniformly from $25.0\,\frac{\text{m}}{\text{s}}$ to rest in 20.0 s, what is the magnitude of the angular acceleration of the wheels?

8. Three forces are exerted on a rotating object at the distances and in the directions shown.

    What is the total torque on the object? (Take "counter-clockwise" to be the positive sense of rotation.)

6.0 N

60°

40 cm

55 cm

70°

7.0 N

30 cm

40°

5.0 N