1. A ball moves with a constant speed of 4 m/s around a circle of radius 0.5 m. What is the period of the motion?

2. The second hand on a watch has a length of 90.0 mm and makes one revolution in 60.00 s. What is the speed of the end of the second hand as it moves in uniform circular motion?

3. A racecar is traveling at constant speed around a circular track. What happens to the centripetal acceleration of the car if the speed is tripled?

4. A car traveling at 25 m/s rounds a curve so that its centripetal acceleration is 2.5 m/s^2. What is the radius of the curve?

5. A car enters a horizontal, curved roadbed of radius 250 m. The coefficient of static friction between the tires and the roadbed is 0.25. What is the maximum speed with which the car can safely negotiate the unbanked curve?

6. Which force is responsible for holding a car in an unbanked curve?

7. A 0.45 kg ball attached to a string is rotating in a horizontal circle of radius 0.75 m. If the ball revolves four times every second, what is the tension in the string?

Use the following to answer questions 8-9:
One of the world's largest Ferris wheels, the Cosmo Clock 21 with a radius of 50.0 m is located in Yokohama City, Japan. Each of the sixty gondolas on the wheel takes 1.00 minute to complete one revolution when it is running at full speed. Note: Ignore gravitational effects.

8. What is the uniform speed of a gondola when the Ferris wheel is running at full speed?

9. What is the centripetal acceleration of the gondola when the Ferris wheel is running at full speed?

10. A rock is whirled on the end of a string in a horizontal circle of radius R with a constant period T. If the radius of the circle is reduced to $R/2$, while the period remains T, what happens to the centripetal acceleration of the rock?

11. A 250 g mass is attached to a string and is revolving in a horizontal circle of radius 55 cm. It is observed that this mass completes one revolution in 8 s.
    (a) Determine the speed of the mass.
    (b) Determine the centripetal acceleration of the mass.
    (c) Determine the tension in the string.
    (d) The radius of this mass is now increased to 1.5 m and it still takes the same time to complete one revolution. What is the ratio of the new tension to the old tension?

12. A vehicle of mass 2500 kg is making a turn on a curved horizontal road of radius 120 m. The coefficient of static friction between the road and the tires is 0.6.
    (a) Determine the magnitude of the maximum static frictional force between the vehicle and the road.
    (b) Determine the maximum speed with which the vehicle can move.
    (c) Determine the centripetal acceleration of the vehicle.
    (d) Under icy conditions, the coefficient of the static friction goes down to 0.1. Determine the maximum speed with which the vehcile can negotiate this turn.

13. A planet of mass 6×10^{24} kg is revolving around a star of mass 1.2×10^{31} kg. The distance between the planet and the star is 1.8×10^{11} m.
    (a) Determine the force between the two.
    (b) Determine the speed of the planet such that it moves in a circular orbit around the star.
    (c) Determine the time period of the planet.

14. The mass of the Earth is 5.98×10^{24} kg. A satellite is to be placed in a circular orbit around the Earth such that it revolves the Earth once every 8 $hours$. Determine the radius of the orbit for this satellite.