UCM problems

1. A 13 g rubber stopper is attached to a 0.93 m string. The stopper is swung in a horizontal circle, making 30 revolutions in 14 seconds. Find the tangential velocity of the stopper. Find the centripetal acceleration on the stopper as well as the net force acting on the stopper.
2. What if the mass above were doubled, how would that affect velocity, acceleration and force/
3. The radius is doubled all else be3ign as in problem #1. What would that do to velocity, acceleration and Fnet?
4. The period of revolution is half as large, how would that change velocity, acceleration and net force.
5. A runner moving at a speed of 8.8 m/s rounds a bend with a radius or 25 m. What is the centripetal acceleration of the runner? What is it that exerts the net force on the runner?
6. Racing on a flat track, a car going 25 m/s rounds a curve of 95 m in radius. What is the car’s centripetal acceleration? What is the minimum coefficient of friction needed for the car to round the curve without slipping?
7. A 615 kg car completes one lap in 24.3 s around a circular track with a radius of 50.0 m. The car moves at constant speed. What is the acceleration of the car and what is the net force acting on the car to produce this acceleration.
8. A coin is placed on a vinyl stereo record making 33 1/3 revolutions per minute. In what direction is the acceleration of the coin? Find the magnitude of the acceleration when the coin is placed 5.0, 10.0 and 15.0 cm from the center of the record.
9. The wheel of a car has a radius of 0.29 m and is being rotated at 830 rpm on a tire balancing machine. Determine the speed (in m/s) at which the outer edge of the wheel is moving.
10. The bobsled track at the Olympics in Lillehammer, Norway, contained turns with radii of 33 m and 24 m. Find the acceleration at each turn for a speed of 34 m/s, express your answer in multiples of *g*. Find the net force exerted on the sled and its passengers if they have a combined mass of 350 kg.
11. A model airplane has a mass of 0.90 kg and moves at a constant speed on a circle that is parallel to the ground. Find the tension in the guideline (length = 17 m) for speeds of 19 and 38 m/s