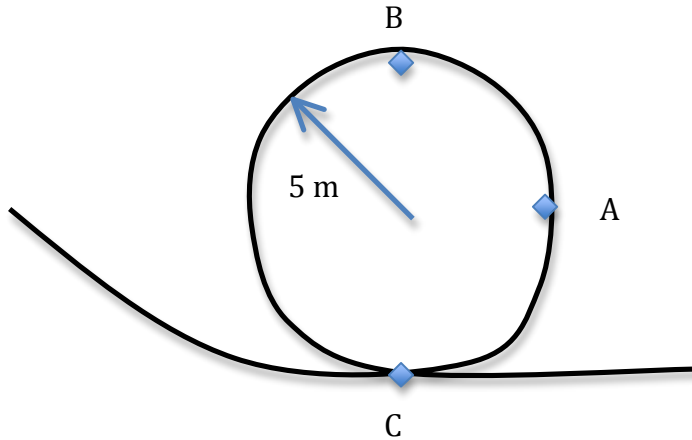


Centripetal Motion

1. A tennis ball, $m=0.2$ kg, is being spun in a horizontal circle of radius 40 cm over a teacher's head. The string has a breaking strength of 15 N.
 - a. Find the maximum speed of the ball before breaking.
 - b. How many revolutions will he make in 10 sec at this speed?
2. The cart, $m=100$ kg, is doing the loop-the-loop as shown. Its speed at point A is 13 m/s. Find the force on the track at A, B, and C. (Hint: speed isn't constant).



3. Our poor ant is in a centrifuge of radius 10 cm and feels 200 g's.
 - a. Find the speed of the ant.
 - b. Find the period of motion.
4. What coefficient of friction between the tires and the road is needed for an automobile to make a right hand turn of radius 24 m at 18 m/s?
5. Fred decides to give the family toy poodle ($m=2.5$ kg) the joys of an amusement park ride. He gently places the poodle in the dryer, which has a radius of 40 cm. The dog is securely strapped to the chamber which then makes a vertical circle every 1.27 sec.
 - a. What was the force of the poodle against the wall at the bottom of the ride?
 - b. At the top of the ride?