

CIRCULAR MOTION WORKSHEET I

1. A cord 0.65 m long exerts a centripetal force of 11.6 N on a whirling 0.10 kg mass tied to the end of the cord. What is the velocity of the whirling mass? (8.7 m/s)
2. A 13 500 N car traveling at 50.0 km/h rounds a curve of radius 2.00×10^2 m. Find:
 - (A) the centripetal acceleration of the car (0.965 m/s²)
 - (B) the centripetal force (1330 N)
 - (C) the minimum coefficient of friction between (0.0985)
 - (D) On a rainy day, the coefficient of friction is 0.050. What is the maximum safe speed of the car under these conditions? (35.6 km/h)
3. A 1000 kg car is going around a flat curve with a radius 30 meters. If the coefficient of friction between the car's tires and the road is 0.5, what is the maximum speed at which the car can make the turn? 12 m/s
4. Suppose that the coefficient of friction between a typical tire and a particular highway surface is 0.75. What should the minimum radius be for flat curves on this highway if the speed limit is 55 miles per hour? 270 ft
5. A remote controlled car moves around a curve at a velocity of 1.5 m/s and a centripetal acceleration of 3.6 m/s². What is the radius of the curve? 0.63 m
6. A string that is 0.65 m long exerts a centripetal force of 11.6 N on a 0.10 kg yo-yo that is whirling on the end of the string. What is the velocity of the yo-yo? 8.7 m/s
7. An athlete whirls a 7.00 kg hammer tied to the end of a 1.3 m chain in horizontal chain. The hammer makes one complete revolution in 1.0 s.
 - (A) What is the centripetal acceleration of the hammer? 51 m/s²
 - (B) What is the tension in the chain? 360 N
8. A carnival ride has a 2.0 m radius and rotates 1.1 times per second. When the floor drops out, riders are held up by friction.
 - (A) What is the velocity of the rider? 14 m/s
 - (B) What coefficient of friction is needed to keep the riders from slipping? 0.10

