

**Circular Motion Worksheet**

Name \_\_\_\_\_

Period \_\_\_\_\_ Date \_\_\_\_\_

1. A cyclist turns a corner with a radius of 50m at a speed of 10m/s.
  - a. What is the cyclist's acceleration? *2.2 m/s<sup>2</sup>*
  
  - b. If the cyclist and cycle have a combined mass of 120kg, what is the force causing them to turn? *240 N*
  
2. A 60 kg Gila monster on a merry-go-round is traveling in a circle with a radius of 3 m at a speed of 2m/s.
  - a. What acceleration does the monster experience? *1.33 m/s<sup>2</sup>*
  
  - b. What is the net force? How does this compare with the monster's weight? *80 N, 600 N*
  
3. A 515kg roller coaster is at the bottom of a loop with a radius of 10m. If the speed at the bottom of the loop is 20m/s, what is the force of the track pushing up on the vehicle at this point? *25,750 N*
  
  
  
  
  
  
  
  
  
  
4. A 14000N car traveling at 25m/s rounds a curve of radius 200m. Find the following:
  - a. The centripetal acceleration of the car. *3.125 m/s<sup>2</sup>*
  
  - b. The force that maintains centripetal acceleration. *4375 N*
  
  - c. The minimum coefficient of static friction between the tires and road that will allow the car to round the curve safely. *0.3125*
  
  
  
  
  
  
  
  
  
  
5. Timmy the angry teen twirls a dead rat (mass = 2 kg) attached to a rusty chain (length = 1m) in a vertical circle. With what velocity should Timmy rotate the rodent so that the chain just goes slack (no force in the chain) at the top? *3.16 m/s*