

## Circular Motion Review

1. A force of 40 N is applied to the handles of the Big Wheel in the Price is Right Showcase Showdown. If the big wheel has a diameter of 2 meters and a mass of 40 kg, what angular acceleration will this produce?
2. Find the moment of inertia of the earth. Radius is 6,000 km and mass is  $6 \times 10^{24}$  kg.
3. A 50 kg snowboarder carves a turn with a radius of 10 m. If he is moving at 5 m/s, what force is needed to keep him in this path? What causes this force?
4. A roller coaster dips into a valley with a radius of 15 m. If the coaster is moving at 12 m/s at the very bottom of the valley, what normal force will the 70 kg passenger feel?
5. A 2000 kg car crests a hill with a radius of 20 m. At what speed will the wheels of the car begin leaving the ground?

6. A 25 kg pail of water is whirled in a vertical circle. What is the minimum speed it can be moving at the top of the circle, so that the water will not fall out of the pail? ( $F_n$  is just zero)
  
  
  
  
  
  
  
  
  
  
7. How many radians will a wheel that rotates at 100 rpm rotate through in 3 seconds?
  
  
  
  
  
  
  
  
  
  
8. Find the angular acceleration of a CD that changes from 20 rad/sec to 5 rad/sec in 5 seconds.
  
  
  
  
  
  
  
  
  
  
9. A wheel rotates 3 complete times. What is its angular displacement?
  
  
  
  
  
  
  
  
  
  
10. Find the average angular velocity of a wheel that rotates 30 times in 12 seconds.
  
  
  
  
  
  
  
  
  
  
11. How far will a 2 m diameter wheel roll if it rotates through 3 radians?