Name: _____ Block: _____

Centripetal Force

1. Find the force needed to keep a 0.5 kg ball spinning in an 0.70 m-radius circle with an angular velocity of 15 revolutions every 10 s.

9.90 N

2. Find the force of friction needed to keep a 3 000 kg car traveling with a speed of 22 $\frac{\text{m}}{\text{s}}$ around a highway exit ramp curve that has a 100 m radius.

14 520 N

3. A passenger on an amusement park ride is cresting a hill in the ride at 15 $\frac{\text{m}}{\text{s}}$. If the top of the hill has a radius of 30 m, what force will a 50 kg passenger feel from the seat? What fraction of the passenger's weight is this?

375 N
0.77 or 77%

4. A roller coaster has a vertical loop with a 40 m radius. What speed at the top of the loop will make a 60 kg rider feel "weightless?"

19.8 $\frac{\text{m}}{\text{s}}$

5. A ride called "The Rotor" at Six Flags is a cylinder that spins at 56 revolutions per minute, which is enough to "stick" people to the walls. What force would a 90 kg rider feel from the walls of the ride, if the ride has a diameter of 6 m?

9 285 N