
Circular Motion and Gravitation Assignment**/20**

1. A 2.0 kg box is placed on the floor at the edge of a merry-go-round of radius 6.0 m. The coefficient of friction between the box and the floor is 0.30. The merry-go-round accelerates from rest and eventually the box slides off the edge. Determine the speed of the merry-go-round when this occurs.

2. A car travels over the crest of a hill at 6.0 m/s. The radius of curvature is 15 m.
 - a) Determine the force exerted by the car seat on a 30 kg.

 - b) If the passenger wishes to feel "weightless", how fast must they go?

3. Suppose a 5000 kg satellite orbits the earth at 3.58×10^7 m above the earth's **surface**. Determine the total energy of the satellite.

4. On December 24, 1968 the Apollo 8 command module became the first manned vehicle to go into orbit above the surface of the moon. Assuming that the orbit was approximately circular and the vehicle was 110 km above the surface of the moon, determine
- the orbital velocity of the spacecraft

b) and the period of motion.