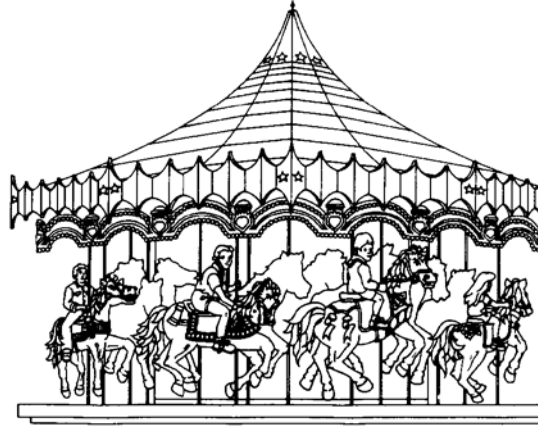# The Carrousel

The Carrousel is a giant rotating platform. Use the concepts of rotational kinematics and dynamics to answer the following questions.

1. Measure the period of rotation.
   (Hint: See Appendix B.)

2. What is the angular velocity ω?

3. Calculate the tangential speed v_T
   a. For the inner ring of the carrousel. (r_i = 5.3 m)

   b. For the outer ring. (r_o = 7.2 m)

4. What is the centripetal acceleration a_c
   a. For the inner ring?

   b. For the outer ring?

   c. What are the values of a. and b. in g's? How does these compare to the g's experienced on other rides in the park, such as the Storm Runner?

5. Calculate the centripetal force F_c experienced by a rider on the
   a. Inner ring.

   b. Outer ring.

6. Measure the centripetal force using your accelerometer (either handheld or electronic).
   a. F_c = _____N

   b. Compare this value with the one you calculated in number 5.

7. Suppose an outer ring rider's shoe flew off their foot.
   a. How fast and in what direction (with respect to the radius of the ride) would the shoe be flying? (Hint: Draw a diagram.)

   b. The ride is 0.264 m off the ground. How far will the shoe fly before reaching the ground?