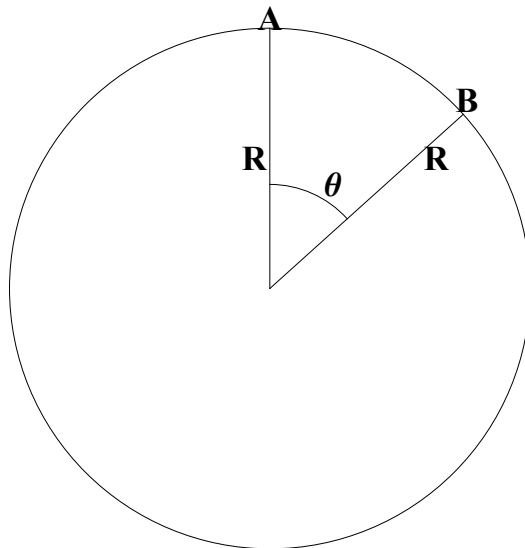


PHYS 111

HOMEWORK #9

Due : 10 November 2016

1. A geosynchronous satellite orbits the Earth in a period of 24 hours, thereby remaining over the same spot on the surface of the Earth. Determine the radius of this orbit (measured from the center of the Earth).
2. Determine the period of a satellite in low Earth orbit (about 200 km above the surface of the Earth).
3. Problem 51, p. 178.
4. A mass starts at rest from position A on the sphere as shown below. The mass is set in motion and slides without friction to point B.
 - a) What is the vertical difference between points A and B?
 - b) What is the speed of the mass at B (assuming it started at rest at A)? Express your answer in terms of R , g and θ .



5. Problem 4, p. 213
6. Problem 8, p. 214. Answer parts a) - d) and also : If the package is at rest at the top of the chute, what is its speed at the bottom? (Five points each part).

7. Problem 18, p. 214.

8. Problem 37, p. 215

9. Problem 44, p. 216.

10. Problem 52, p. 216. Use the diagram provided in the text for reference, but solve the problems using only symbols. In other words, the mass is m , the spring of constant k is compressed by an amount Δx , it travels for a distance L . Use this information to determine an expression for the coefficient of friction between the block and the table.