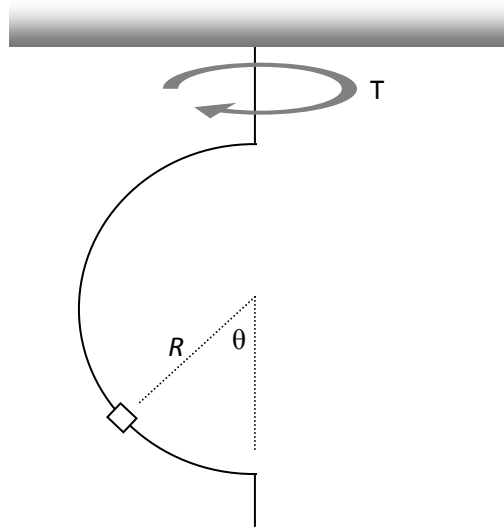


AP Physics C
Bead on a wire



The circularly bent frictionless wire of radius R shown above is spun with period of revolution T . A bead riding on the wire is in vertical equilibrium. Neglect air resistance.

- Draw a free body diagram of the bead at the moment in time shown above.
- Calculate the period of revolution T as a function of angle θ , radius R , and the acceleration due to gravity g for a bead in vertical equilibrium.
- Use your answer to part (b) to calculate the period of revolution needed to produce a bead position angle of 45° on a semi-hoop with radius of 10 cm. Express your answer in seconds.
- What is the highest angle allowed by this system? (Imagine you can spin it as fast as you want.)