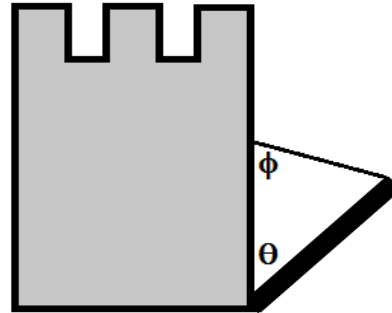


AP Physics 1 Unit #2 Pretest Problem

Name _____

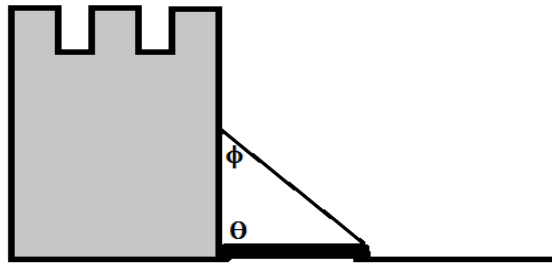
Period _____

A castle has a 4.0 m long drawbridge that is currently raised as shown to the right. The angle $\theta = 45.0^\circ$ and the angle $\phi = 67.0^\circ$. The mass of the drawbridge is 300.0 kg. Answer the following questions based on this information.



1. What is the torque about the pivot at the bottom of the drawbridge that is due to the weight of the drawbridge?
2. What is the net torque about the pivot at the bottom of the drawbridge?
3. What is the tension in the cable that is supporting the drawbridge?

4. Describe one modification that could be made to reduce the tension in the cable. Include an explanation using physics principles of why the tension would be reduced by your modification.



5. The drawbridge is now slowly lowered to the ground and comes to rest as shown in the picture above. At this point in time the tension in the cable is zero and all of the weight of the bridge is supported by the ground at the right end and the pivot at the left end. The support force of the ground can be considered to be applied 0.5m from the right end of the drawbridge. The support force at the pivot is applied at the left end of the drawbridge. What is the support force at the pivot end of the bridge?