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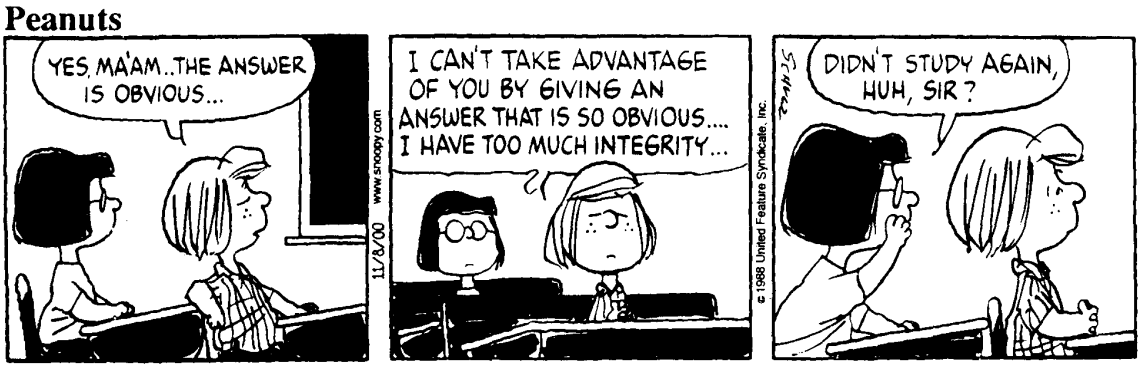
AP Physics – Work is Still a Four Letter Word – 23

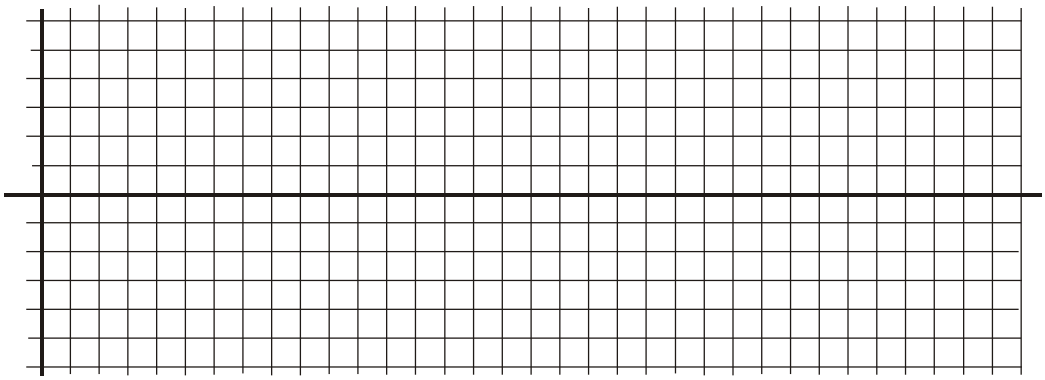
Name _____Per__



We sleep safely in our beds because rough men stand ready in the night to do violence to those who would do us harm.
-- George Orwell

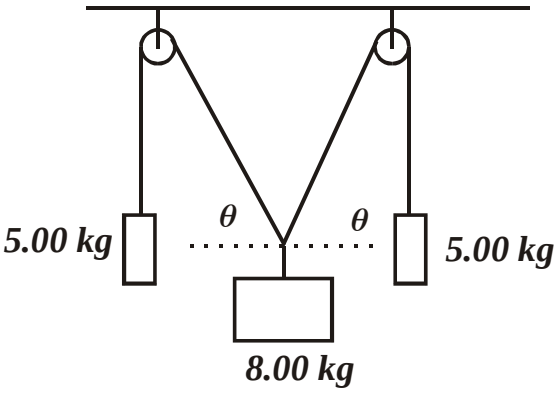
1. A 0.44 kg ball is thrown straight down from a bridge with an initial velocity of 12.5 m/s. It travels for 1.5 seconds. Find: (a) The height of the bridge, (b) the potential energy of the ball before it is thrown, and (c) the total energy of the ball 2.50 m above the water below.

2. You travel down the highway, starting from rest. You travel for 0.30 hours at a speed of 70 mi/h. Then you stop and eat your lunch for 30.0 min. Then you travel for 0.25 hours at 70 mi/h. Then you are forced to wait for 15 minutes for roadwork. Then you travel for 15 minutes at only 35 mi/h. Make a velocity vs. time graph of this motion.

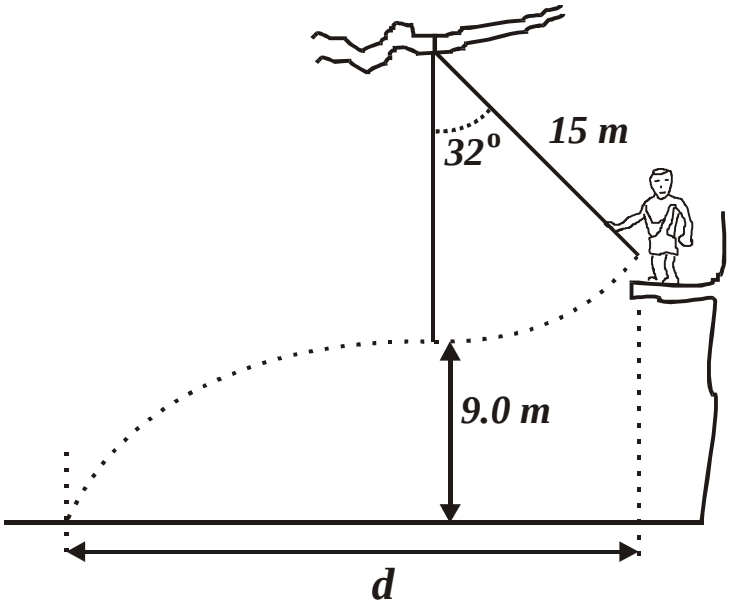


3. A 2.5 kg box slides across the flat surface of a table. The coefficient of kinetic friction for the table/box is 0.295. The box is attached to a light string that passes over a low friction pulley and is connected to a 3.0 kg mass that is hanging vertically. Find (a) the acceleration of the system (b) the velocity of the 2.5 kg box after it has been dragged 0.25 m if its initial velocity was 0.25 m/s, and (c) the kinetic energy of the box at 0.25m.

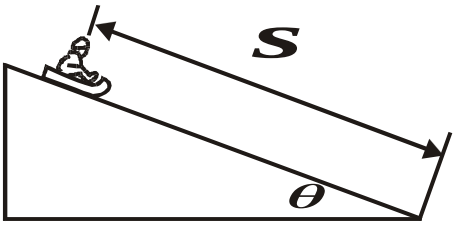
4. Find the two angles if the system is at rest.



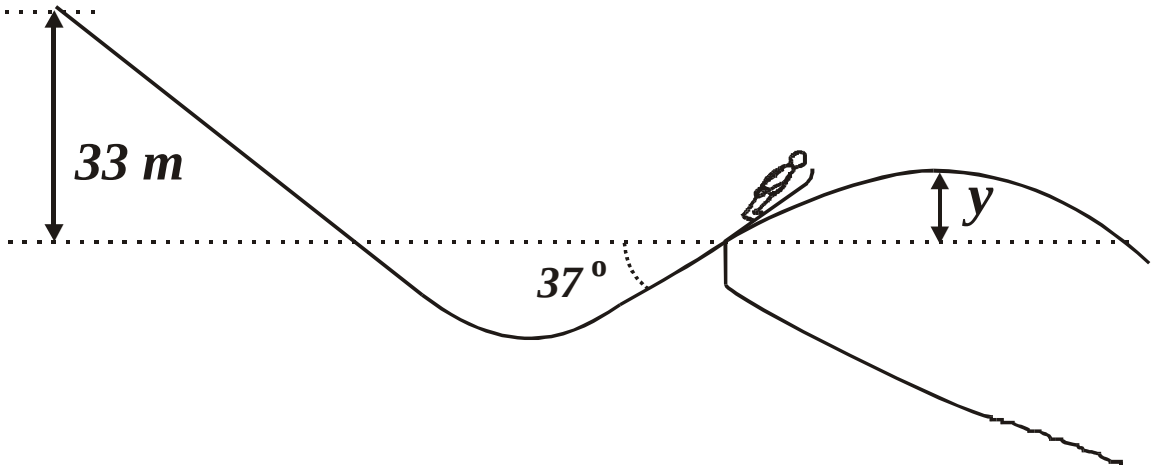
5. Tarzan is above the floor of the jungle on a limb. He swings out on a vine and lets go of it when he is at the lowest point of the swing. At this point, he is 9.0 m above the ground. How far horizontally did he travel from when he first started his swing?



6. A sled coasts down a hill as shown. The angle the slope makes with the horizontal is 41°. The distance ***S*** is 35 m. Find the speed of the sled at the bottom of the hill.



7. A ski jumper sails down a slope as shown. Find the vertical distance ***y*** that the skier travels from the edge of the bottom of the ski jump.



8. You pull a box across the floor with a force of 425 N at an angle of 35.0°. The coefficient of kinetic friction is 0.305. The mass of the crate is 125 kg. Find: (a) the acceleration of the box and (b) the amount of work done in moving the crate a distance of 3.50 m.