AP Physics – Torque – 36

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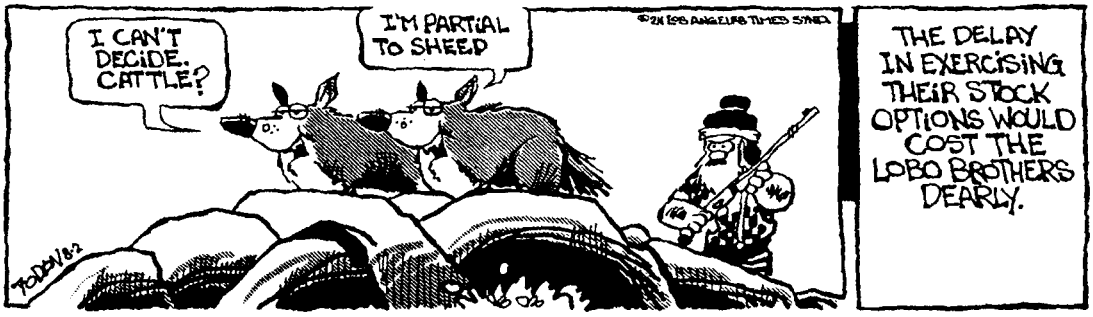
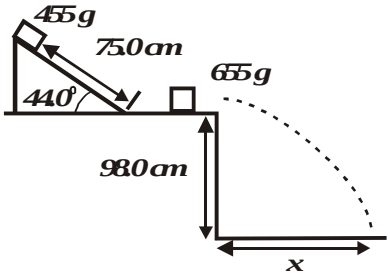


Truth does not change according to our ability to stomach it. -- Flannery O'Connor

1. A 455 g block is positioned as shown on a smooth ramp. A 655 g block rests on a smooth table top. The 455 g block is released, slides down the ramp and undergoes a perfectly inelastic collision with the other block. The two blocks slide off the table and fall to the floor, striking it a horizontal distance ***x*** from the edge of the table. Find the following: (a) the potential energy of the 455 g block before it is released, (b) the speed of the 455 g block at the bottom of the ramp, (c) the speed of the two blocks after the collision, (d) the distance ***x*** the two blocks travel before they hit the floor, and (e) the kinetic energy of the two blocks just before they hit the floor.



2. A uniform 4.00 m long rod weighs 235 N. One end of it is attached to a wall and a cable supports the other end. The cable makes an angle of 41.0° with the rod. Find the tension in the cable and the components of the force exerted by the wall on the rod.

3. What is the wavelength in nanometers of an electromagnetic wave that has a frequency of 2.35×10^{16} Hz?