## Physics - Projo Tako Homo Testo

Instructions: For full credit, you must show sketch, when required, show all your work, use proper units, and circle your answers.

Phlegm $\qquad$ Per $\qquad$


1. You drop a bottle with a message in it off a cliff of unknown height, but you noticed it took 3.5 seconds to hit the water. How high is the cliff? How long will it take for the rock to fall half that distance? What would its speed be at this point?
2. The mighty USS Herpes, a fine pocket battleship, fires off a round that travels a horizontal distance of 32.0 km . The projectile has a time of flight time of 1 min and 40 s . Find the elevation angle for the gun.
3. A ball rolls across a table at a constant speed for 0.62 m . It then falls onto the floor. It takes the ball 0.35 s to cover the 0.62 m . The path of the ball is shown in the drawing. The tabletop is 1.2 m above the floor. Find $\boldsymbol{x}$, the distance that the ball travels horizontally after it leaves the tabletop.

4. A ball is kicked towards a fence from a point 32.0 m away. The velocity of the ball as it leaves the kicker's foot is $20.0 \mathrm{~m} / \mathrm{s}$ at an angle of $37.0^{\circ}$ with the horizontal. The top of the fence is 2.50 m . Air resistance is negligible. Find:
(a) The time it takes for the ball to reach the plane of the fence.
(b) Will the ball hit the fence? If so, how far from the top of the fence will it hit? If not, how far above the fence will it pass?

