PROJECTILE MOTION

Ignore the effect of air resistance when calculating an answer and assume a constant vertical acceleration of 9.8 m/s/s downward.

1. A projectile is launched horizontally with a speed of 3.5 m/s and travels 5.4 meters before striking the ground.

    a. From what height was the projectile launched?

    b. Conceptual: If the launch velocity of the projectile were increased how would this affect the time the projectile is airborne? Explain.

2. A ball rolls horizontally off the edge of a tabletop that is 1.2 m high. It strikes the floor at a point 1.5 m horizontally away from the edge of the table.

    a. How long is the ball in the air?

    b. What is its speed at the instant it left the table?

3. A rifle is aimed horizontally at a target 30.5 m away. The bullet hits the target at 1.9 cm below the aiming point.

    a. What is the bullet's time of flight?

    b. What is the muzzle velocity of the rifle?

4. A pelican flying along a horizontal path drops a fish from a height of 5.4 m while traveling 5.0 m/s.

    a. How far does the fish travel horizontally before it hits the water below?

    b. Give both the horizontal and vertical components of velocity before the fish hits the water.

    c. Conceptual: If the pelican continues flying at a constant velocity, where is the pelican relative to the fish when the fish hits the water? Explain.