Projectile Motion Worksheet B*

1. A man standing on the roof of a building 30 m high throws a ball directly downward with an initial velocity of 5 m/s.

    A) What is the velocity of the ball after it has been falling for 0.5 s?

    B) Where is the ball after 1.5 s?

    C) What is the velocity of the ball as it strikes the ground?

2. A stunt car traveling at 20 m/s rolls off the edge of a cliff. The cliff is 44.1 m above the ocean. How far from the base of the cliff does the car strike the water?

3. When my great aunt used to play pool, she had an annoying habit of hitting the cue ball into the air and off the table. If she hit the ball at an initial speed of 5 m/s at an angle of 60° above the table (yes, she did do this), and the table was 1.0 m high

    A) How long was the cue ball in the air?

    B) If a bug was 3.0 m away in a direct line with the shot, would it get hit (and squished) by the cue ball?

4. A missile is launched from the ground at 196 m/s at an angle of 60° above the horizontal. Determine:

    A) the maximum altitude attained by the missile

    B) the time the missile is in the air

    C) the horizontal distance traveled by the missile

    D) the final velocity of the missile

    E) the horizontal distance traveled by the missile **if** it was now aimed at an angle of 30° above the horizontal?

    F) If the sergeant in charge of the missile launcher wanted the missile to go the maximum distance, how would she aim the missile launcher?

5. A cat, jumping from the back of the couch landed on the newly waxed coffee table. The cat slid to the edge of the table and fell off. If the table was 0.6 m high and the cat landed 0.40 m from the edge of the table, how fast was the cat traveling when it "became a projectile"?

6. "Bonus": It has been said that in his youth, George Washington threw a silver dollar across a river. Assuming that the river was 300 m wide

    A) What was the minimum initial speed necessary to get the coin across the river?

    B) How long was the coin in the air?

Answers: 1. A) 9.9 m/s [down], B) 11.5 m above ground, C) 24.8 m/s   2. 60 m

3. A) 1.07 sec, B) 2.68 m, so no   4. A) 1474 m, B) 34.6 sec, C) 3390 m, D) 196 m/s [60°
below horizontal], E) 3390 m, F) 45°   5. 1.14 m/s   6. A) 54.2 m/s, B) 7.8 sec

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