Projectile Motion Problem Set Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Identify the problems as golf ball or cliff; use the flow chart.*

1. A plane flying 85 m/s wishes to drop a package onto a small island 300 meters below. How far in advance of the island should the package be dropped?

2. A rifle is aimed directly at the bull’s eye of a target 50 meters away. If the bullet has a speed of 350 m/s, how far below the bull’s-eye will the bullet hit?

3. A gazelle is launched at 200 m/s at a 40 degree angle above the horizontal.

a. What is the horizontal component of the gazelle’s velocity?

b. What is the vertical component of the gazelle’s velocity?

c. How much time will the gazelle be in the air?

d. How far will the gazelle travel before it hits the ground?

e. How high will the gazelle go?

4. During WWI, the Germans had a gun called Big Bertha that was used to shell Paris. The shell had an initial speed of 1700 m/s, and was shot with an inclination of 55 degrees. In order to hit the target, adjustments were made for air resistance. Ignoring frictional effects, calculate the following:

 a) How long was the shell in the air?

 b) How far away did the shell hit?

 c) How high did the shell go?

5. If a ball traveling across your desk at a speed of 3.0 m/s goes over the edge, how far from the desk will the ball land? The desk is 0.80 m tall.

5. A rescue line is to be thrown horizontally from the bridge of a ship 30 m above sea level to a lifeboat 30 m away. With what speed should it be thrown?

2A Level 4 # 8 Projectile Motion Challenge Problems

1. A ball is kicked at an angle of 35 degrees at a velocity of 20 meters per second. A tall fence is 12 meters away.

a. How much time will it take for the ball to reach the fence?

b. How high above the ground will the ball hit the fence?

2. A ball thrown horizontally from the roof of a building at 30 m/s lands 60 meters away.

 a) How tall is the building?

 b) What is the **VELOCITY**  (magnitude and direction) the ball when it hits the ground?

 This is the RESULTANT.

3. A golf ball is hit with an initial velocity of 30 m/s at an angle of 30.0 degrees above the horizontal and lands 2.0 m below where it was hit.

 a) How much time is it in the air?

 b) How far does it travel?