Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Physics 11

**Worksheet 3.4 Part 1  
Horizontal Initial Velocity**

1. A rock is thrown horizontally from the top of a cliff 98 m high, with a speed of 27 m/s.
   1. How long is the rock in the air?
   2. How far from the base of the cliff does the rock land?
   3. With what velocity does the rock hit the ground?
2. A rescue pilot wishes to drop a package of emergency supplies so that it lands as close as possible to a target. If the plane travels with a velocity of 81 m/s and is flying 125 m above the target, how far away (horizontally) from the target must the rescue pilot drop the package?
3. A bullet is fired with a horizontal velocity of 330 m/s from a height of 1.6 m above the ground. How far does the bullet travel before it hits the ground?
4. A fireman is standing on top of a building 20 m high. He finds that if he holds the hose so that water shoots from it horizontally, at 12 m/s, the water will hit a burning wall of an adjacent building at a height of 15 m above the ground.
   1. How far away is the adjacent building?
   2. With what velocity does the water hit the building?

**Answers:** 1a) 4.47 s 1b) 121 m 1c) 51.5 m/s [58.4o below horizontal] 2) 409 m 3) 189 m  
4a) 12.1 m 4b) 15.6 m/s [39.5o below horizontal]