
Type I Projectiles

1. A ball is pushed off of a 120.0 m building at a horizontal velocity of 16.0 m/s. Determine
 - a. the time it takes to reach the ground.

 - b. the distance the ball lands away from the building at the ground level.

 - c. the vertical velocity if the ball just before it hits the ground.

 - d. the total velocity the ball reaches just before it hits the ground below the building.

2. A physics student drops a steel ball out of a car window. The car's speed is 40.0 m/s. The height of the window is 1.30 m. Calculate
 - a. the time it takes for the ball to hit the ground.

 - b. the horizontal distance traveled by the ball while falling.

 - c. the vertical velocity of the ball as it hits the ground.

 - d. the overall speed of the ball as it hits the ground.

3. A cliff diver is on a 30.0 m high cliff. With what velocity should they leave the cliff, (assume the person jumps out horizontally) in order to miss 8.0 m of rock coming from the cliff's base?

8. A rock is tossed off a bridge horizontally at 9.0 m/s and strikes the ground below 3.2 s later. How high is the bridge and what was the range of the throw?
9. A rifle is shot horizontally at 300 m/s from a height of 1.8 m. What is the maximum distance the bullet will travel before hitting the ground?
10. Water sprays horizontally out of a shower head which is 2.12 m above the ground. If the water hits the shower floor 0.85 m from the wall of the shower how fast was the water coming out the showerhead?
11. A supply plane flying at 250 m/s releases supplies 3900 m in front of survivors of a shipwreck. How high is the plane?

Answers: 1a) 4.95 s, b) 79.2 m, c) 48.5 m/s, d) 51.1 m/s, 2a) 0.52 s, b) 20.8 m, c) 40 m/s, d) 40.3 m/s, 3) 3.23m/s, 4) 9.58 m, 5) 115 m, 6) no, 2.47 m, 7) 8.57 m, 8) h=50.2m, r= 28.8 m, 9) 182 m, 10) 1.29 m/s, 11) 1.19×10^3 m