

More Cliff Problems

4. A ball is shot horizontally from a window. It has an initial horizontal velocity of 4 m/s and is in the air for 1.35 seconds before hitting the ground.
 - a. How high is the window?
 - b. How far away (horizontally) from the edge of the building does the ball land?
 - c. What are the horizontal and vertical components of the ball's velocity when it lands?
 - d. How fast is the ball going when it lands?

5. The Coyote is chasing the Road Runner when the Road Runner suddenly stops at the edge of a convenient cliff. The Coyote, traveling with a speed of 25 m/s, does not stop and goes flying off the edge of the cliff, which is 200 meters high.
 - a. How long is the Coyote in the air?
 - b. Where does the Coyote land?
 - c. What are the horizontal and vertical components of the Coyote's velocity when he lands?
 - d. How fast is the Coyote going when he lands?

6. A plane is flying across a level field and is 150 meters off the ground. When the plane is directly over point A, it releases a package, which then falls to the ground, and lands at point B, which is 500 meters away from point A. Calculate the following:
 - a. The total time the package was in the air.
 - b. The initial velocity of the package. (Give the components.)
 - c. The final velocity of the package just as it hits the ground. (Give the components.)
 - d. The final speed of the package just as it hits the ground.

Answers: 4. a) 9.1 m b) 5.4 m c) $v_x = 4 \text{ m/s}$ & $v_y = 13.5 \text{ m/s}$ d) 14.1 m/s
 5. a) 6.32 s b) 158.1 m c) $v_x = 25 \text{ m/s}$ & $v_y = 63.2 \text{ m/s}$ d) 68 m/s
 6. a) 5.48 s b) $v_x = 91.3 \text{ m/s}$ & $v_y = 0 \text{ m/s}$ c) $v_x = 91.3 \text{ m/s}$ & $v_y = 54.8 \text{ m/s}$ d) 106.5 m/s