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?

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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 m/s & v_y = -13.5 m/s*	*d) 14.1 m/s*
5. a) 6.32 s	*b) 158.1 m*	*c) v_x = 25 m/s & v_y = -63.2 m/s*	*d) 68 m/s*
6. a) 5.48 s	*b) v_x = 91.3 m/s & v_y = 0 m/s*	*c) v_x = 91.3 m/s & v_y = -54.8 m/s*	*d) 106.5 m/s*