Projectiles #1

1. A swallow is carrying a coconut horizontally across the ground with an air speed velocity of 11 m/s. Suddenly, the bird loses his grip on the husk, and it falls to the ground. It hits after 2.5 seconds.

   (a) Draw a diagram of the situations and write down knowns and unknowns.

   (b) How high was the swallow flying?

   (c) How far across the ground did the coconut travel?

   (d) What is the x- and y- velocity of the coconut just before hitting the ground?

   (e) What is the magnitude and direction of the resultant velocity just before hitting the ground?

2. A plane is flying 30 m above the ground. A package is dropped from the plane and travels 50 m horizontally before finally striking the ground.

   (a) Draw a diagram of the situations and write down knowns and unknowns.

   (b) How long did it take the package to hit the ground?

   (c) How fast must the plane have been flying?

   (d) What is the x- and y- velocity of the package just before it hits the ground?

   (e) What is the magnitude and direction of the final resultant velocity of the package just before it hits the ground?