

Ch. 3 Worksheet

A stone is projected at a cliff of height h with an initial speed of 42.0 m/s directed at angle of 60.0° above the horizontal. The stone strikes at the top of the cliff, 5.50 s after launching. Find (a) the height of the cliff, (b) the speed of the stone just before impact, and (c) the maximum height H reached above the ground.

A. Problem solving consists of using a generic method, in an orderly manner, for finding solutions to problems. For this problem what problem solving strategy will you be using? In other words, what steps will you follow to solve this problem?

B. Critical thinking is defined as the process of conceptualizing, applying, analyzing, synthesizing, and evaluating information. Let's think critically about the following questions:

a. Conceptualizing: What will happen to the key when it hits the boat?

b. Analyzing: What are the directions of motion for the key and boat?

c. Evaluating: Can we use our equations of linear motion for this problem? Why or why not?

C. Let's solve the problem! (Applying)

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1. A cannon ball is fired from ground-level with initial speed of v_0 and angle of elevation θ . A wall is located at a distance D downrange, and the wall has a hole in it at a height of H above the ground.
 - a. In terms of H , v_0 , and θ determine where you need to put the cannon so that the cannonball will pass through the hole in the wall.
 - b. Is there more than one such position? Justify your answer.
 - c. Where would need to put the cannon so that the cannonball will go through a hole that is located 150 m above the ground. Assume that the cannon launches the projectile at 11.0 m/s at angle of $\theta = 40.0^\circ$.