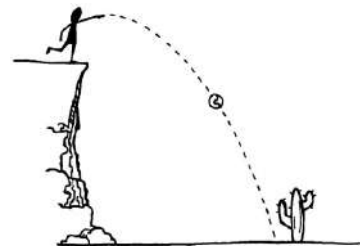


NAME _____

DATE _____

Scenario

A rock is thrown horizontally with speed v from the top of a cliff of height H , as shown in the diagram to the right.

**Using Representations**

PART A: On the diagram, choose a location for a horizontal and vertical origin. Label your choice with $x = 0$ and $y = 0$ on the diagram. Choose a horizontal and vertical positive direction and label those directions on the diagram using arrows.

Quantitative Analysis

PART B: Identify an equation that can be used to solve for the time it takes the rock to hit the ground. Write the equation below. (If you're having trouble finding the right equation, refer to your notes, your textbook, or the AP Physics 1 equation sheet.)

PART C: Rearrange the equation you wrote above in Part B to solve for the time it will take the rock to hit the water. Your final equation should only contain given variables and physical constants. (H , v , and physical constants as necessary).

$t =$ _____

PART D: Identify an equation that can be used to solve for the horizontal distance between the bottom of the cliff and the place where the rock lands. Write the equation below.

PART E: Rearrange the equation you wrote above in Part D to solve for the horizontal distance D between the bottom of the cliff and the place where the rock lands. Answer in terms of H , v , and physical constants as necessary.

$D =$ _____

1.M Projectile Motion

PART F: How, if at all, would the equations written in Parts C and E change if the projectile was thrown from the cliff at an angle above the horizontal? Explain your answer.
