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| **PH 201 Pre-Lab 04** | **2 Dimensional Motion** | **Name** |  |

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|  | In this week’s lab we are going to measure the distance (R), a ball travels when launched from a tabletop a distance (H), above the floor. We are interested in determining the ball’s initial velocity which is assumed to be purely horizontal. |

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| 1. What kinematical variables are involved in this situation? |
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| 2. While we shall not explicitly measure time, what is the equation in terms of time that determines the range of the ball? |
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| 3. We shall find the time we need for question 2, by determining the time it takes the ball to fall to the ground? Write down the equation that relates the motion in the vertical direction with time. Manipulate this equation to solve for time in terms of g, and H. |
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| 4. Now plug the result of question 3 into the answer to question 2, to get the range formula for this lab. |
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| 5. In this lab, we do not know the initial velocity, and we do measure experimentally the range. Solve the expression in question 4, so that we can determine the initial velocity from measuring the range and the height. |
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