General Physics I–Honors: PHYS 101H (Fall 2022)
Quick quiz 3

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Instructions

These quick quizzes are low-stakes assessment tools to help cement your understanding of our material. They will help you remember the key facts and can serve as a study guide to help you focus on material you are less familiar with. These quizzes do not contribute to your grade and are for your own use.

1. **Without looking at your notes or the textbook, and without consulting with your neighbour**, write your answer to each question in the **first column**.

2. Discuss with your neighbour and use your notes or the textbook as needed to answer each question and write your answers to each question in the **second column**. You should complete the second column, but do not add anything to your first column.

There are four questions.

Question 1

When you are standing stationary on the Earth's surface, the net force on you is zero: the force due to gravity is equal and opposite to the normal force exerted on you by the Earth. Suppose you now jump upwards to catch a frisbee. What happens to the relative magnitudes of these forces in the instant before you jump upwards (i.e. while your feet are still in contact with the ground)?

Question 2

Suppose you are spinning a ball on a string in a horizontal circle. What happens to the ball when you cut the string? Explain your reasoning and **draw a diagram** of the ball's motion.

Question 3

Suppose that three blocks are placed on a frictionless table, as in the figure. If N_1 is the normal force between blocks 1 and 2 and N_2 is the normal force between blocks 2 and 3, then which of the following is correct:

1. $F = N_1 = N_2$
2. $F + N_1 = N_2$
3. $F < N_1 = N_2$

4. $F > N_1 = N_2$
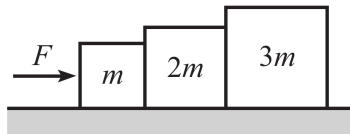5. $F < N_1 < N_2$
6. $F > N_1 > N_2$

Figure 1: Three blocks on a table (question 4).

How does your answer change if we add friction and assume that the blocks are all made of the same material?

Question 4

Why is the mass that appears in Newton's second law the same as the mass that gravity acts on?