

**General Physics I–Honors: PHYS 101H (Fall 2022)**  
**Quick quiz 5**

Chris Monahan  
William & Mary

**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**

An apple falls from a tree. Which of the following does *not* explain why the apple speeds up as it falls? (a) The momentum of the earth-apple system is conserved; (b) There is a downward gravitational force acting on the apple; (c) Gravity does positive work on the apple as it falls; (d) The apple loses potential energy as it falls.

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**Question 2**

In a one-dimensional elastic collision, Ball 1 collides with Ball 2, which is initially at rest. Can the masses be chosen so that the final speed of Ball 2 is larger than the initial speed of Ball 1?

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### Question 3

When you are driving and you press down on the accelerator (i.e. step on the gas!), the car's acceleration is caused by the friction force between the ground and the tyres. The car's speed increases, so its kinetic energy increases. Does the friction force do any work?



### Question 4

If you throw a ball of clay at a wall hard enough that it sticks to the wall, what happens to its momentum? Is it conserved? And what about its energy? Is that conserved?

