**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ PHY2048C, Quiz 4**

**A- Read all the quiz once, or twice, before beginning to write. Make sure to comprehend all questions and start with those you fell most confident.**

**B – Be clear and concise. There are no extra points for being verbose or writing extra.**

**C –Only use the white pages that I will provide. You have 60 minutes to answer the quiz.**

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A diagram of a ball and arrows

AI-generated content may be incorrect.**Problem 1a**

The three balls in the Figure have equal masses and are fired at equals speeds from the same height above ground. Rank in order, from largest to smallest (using <, >, or =), their speeds as they hit the ground.

**Problem 1b**

Several different types of springs

AI-generated content may be incorrect.Rank the springs in terms of the amount of potential energy stored. Greatest first.

**Problem 2**

Consider the next three scenarios:

1. A 1kg particle moves in a vertical plane along the closed path shown in the Figure. Gravity exerts a force along the path.

A diagram of a path

AI-generated content may be incorrect.

1. The rope pulls the 3kg box to the left across a rough surface with a constant acceleration of 1 m/s^2. The tension exerts a force on the box along the path.

A red and brown object with a red stick

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1. The rope pulls the 3kg box to the left across a smooth surface with a constant acceleration of 1 m/s^2. Friction exerts a force on the box along the path.
2. A 2.5kg ball on a string travel once among a circle of circumference 2m. The tension of the string exerts a force on the ball along the path.

Rank these scenarios, from greatest to smallest, in terms of the work done by the mentioned force.

**Problem 3**The proportion of 25-to-34-year-olds still living with their parents has increased by more than a third in nearly two decades. In 2006, some 13% of people in the UK aged between 25 and 34 were living with their parents. By last year, that had increased to 18%. Assuming the number of 25-to-34-year-olds stayed the same in the period, how many of them are living with their parents today?