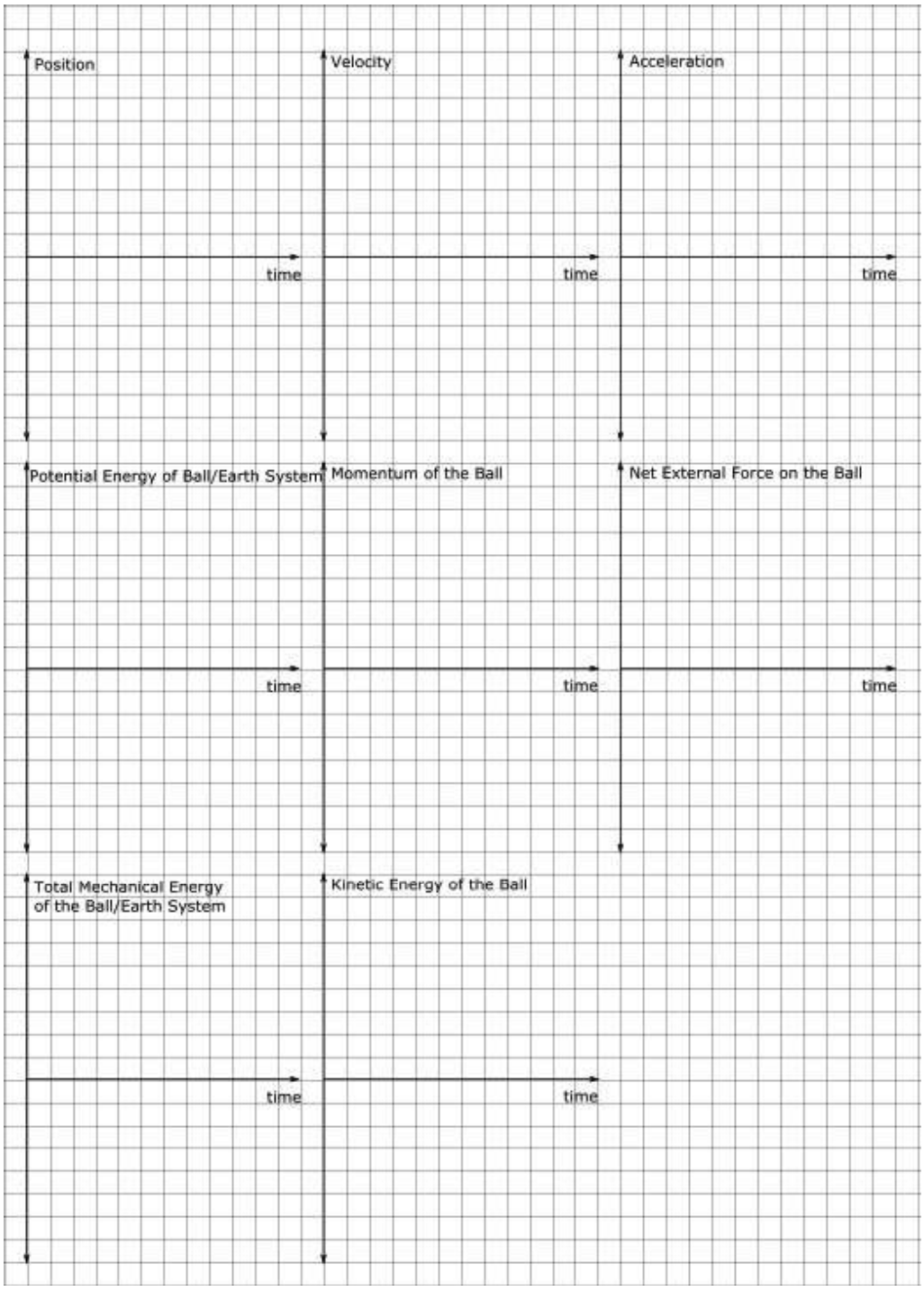
NAME _____ DATE _____

Scenario

A ball is thrown straight up into the air with an initial speed v_0. After a few seconds, it returns to the height from which it was thrown. Air resistance is negligible.

Using Representations

PART A: Sketch the following graphs as functions of time for the time the ball is in the air.



Data Analysis

PART B: The following sentences discuss the relationships between these graphs and the physical ideas they represent. Fill in the blanks.

1. The slope of the position vs. time graph is equal to _____.
2. The slope of the velocity vs. time graph is equal to _____.
3. The area under the acceleration vs. time curve is equal to the _____.
4. The area under the velocity vs. time curve is equal to the _____,
5. The graph of momentum vs. time is the same shape as the _____ vs. time graph because momentum is equal to _____.
6. The net force graph vs. time is the same shape as the _____ vs. time graph because the net force is equal to _____.
7. The slope of the momentum vs. time graph is equal to _____.
8. The area under the curve of the net external force vs. time graph is equal to _____ or _____.
9. The potential energy vs. time graph is the same shape as the _____ vs. time graph because the potential energy is equal to _____.
10. The kinetic energy vs. time graph is related to the _____ vs. time graph because the kinetic energy is equal to _____.
11. The total mechanical energy graph is _____ because it represents the sum of the _____ vs. time and the _____ vs. time graphs. Also, there are no _____ forces on the system, so there is no work done. Therefore, the total mechanical energy is _____.