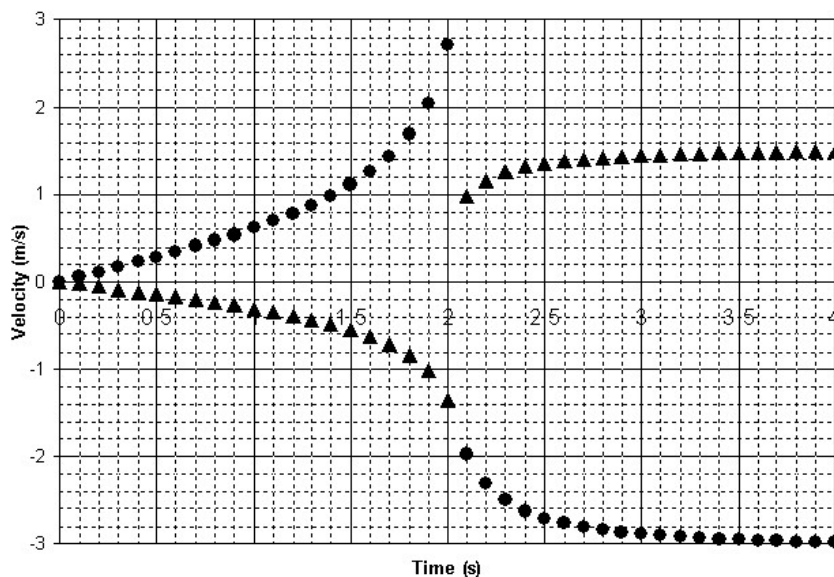


NAME _____

DATE _____

Scenario

Puck 1 and Puck 2 have identical shapes but are made of different conducting materials. Both pucks are set on a nonconducting smooth table an initial distance D apart. Puck 1 is given a charge $-Q$, and Puck 2 is given a charge $+5Q$. The pucks are then released from rest at time $t = 0$. At time $t = 2$ seconds, the pucks collide. After the collision, the pucks have equal amounts of charge. Observing the pucks, Carlos and Dominique measure the pucks' velocities as functions of time, where rightward velocity is positive. The graph shows their data for $0 < t < 4$ seconds. Circles represent Puck 1, and triangles represent Puck 2.

**Data Analysis**

PART A: Using the graph, estimate the initial distance D between the two pucks. Explain your method.

PART B: Which puck is made of material with greater density? Explain your reasoning.

PART C: Is the collision between the pucks elastic? Explain your reasoning.

Argumentation

PART D: The graphs have slopes whose magnitudes increase as time approaches $t = 2$ s and then decrease after $t = 2$ s. Also, the slope of each graph has a magnitude that is greater just before $t = 2$ s than just after $t = 2$ s. In a clear, coherent, paragraph-length response, explain these aspects of the graph using appropriate physical principles.
