NAME _____ **PHYSICS QUIZ #35D**

PERIOD _____ DATE _____ **RELATIVITY - MASS & ENERGY**

A proton, which has a mass of 1.67 x 10^{-27} kg, moving with a velocity of 0.997c collides elastically with a Helium nucleus which has a mass of 6.68 x 10^{-27} kg and which is initially at rest.

1. What is the rest energy of this proton? [3 pts]

2. What is the kinetic energy of this proton as measured by an observer in the rest frame before the collision? [3 pts]

3. What is the mass of this proton as measured by an observer in the rest frame before the collision? [3 pts]

4. What will be the velocity of the proton [3 pts] and the Helium nucleus [3 pts] immediately after the collision as measured by an observer in the rest frame after the collision? [Set up, but do not solve!]

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