Physics 853 Quiz #1 - Friday, Sep. 10, 2010

1. You are designing an accelerator to discover the fabled "juan-on" particle which has an expected mass m_J. You are going to collide "emilons" on a fixed "kevinon" target, which have masses m_E and m_K, through the reaction $E + K \rightarrow J$. What kinetic energy T, should the "emilon" beam have? (give answer in terms of m_K, m_E and m_J.

2. Two spaceships are moving with momenta p_1 and p_2, and collide in free space at space-time coordinate x. Find the time of the collision as recorded by an observer in the center-of-mass frame, and express the answer in terms of Lorentz scalars.