Homework 1

Due 8/25/11

1. Show that the relativistic expression for kinetic energy,

$$\frac{mc^2}{\sqrt{1 - v^2/c^2}} - mc^2,$$

approaches the familiar $\frac{1}{2}mv^2$ when the speed of the object is much smaller than the speed of light. *Hint: Expand the relativistic expression in a Taylor series in powers v^2/c^2 and take just the first term.*