

# Physics 203 Quiz 1

Jun 26, 2013

## Word Problems

Show all your work and circle your final answer. (Ten points each.)

1. When an electron and a positron (its antimatter twin) collide they typically annihilate in a burst of electromagnetic energy. Assume all the energy from the mass of the pair (each equal to  $9.11 \times 10^{-31}$  kilograms) is converted into two photons of energy. What is the wavelength of these photons?

Answer:  $2.43 \times 10^{-12}$  meters

2. An evil genius wants to shrink the Moon in order to steal it. He accidentally shrinks it below its Schwarzschild radius and the Moon is lost forever in a mini-black hole. What is this radius?



Answer: 0.109 millimeters