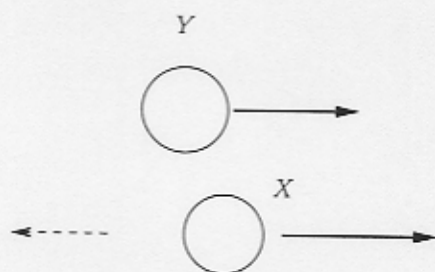


Quantity	Symbol	Value
Coulombs Constant	k_C	$8.98 \times 10^9 \text{ Nm}^2/\text{C}^2$
Electron Mass	m_e	$9.1 \times 10^{-31} \text{ kg}$
Electron Charge	e	$-1.6 \times 10^{-19} \text{ C}$
Electron Volt	eV	$1.6 \times 10^{-19} \text{ J}$
Permittivity	ϵ_o	$8.85 \times 10^{-12} \frac{\text{C}^2}{\text{Nm}^2}$
Magnetic Permeability	μ_o	$4\pi \times 10^{-7} \text{ N} \cdot \text{A}^2$
Speed of Light	c	$3.0 \times 10^8 \text{ m/s}$
Planck's Constant	h	$6.6 \times 10^{-34} \text{ m}^2\text{kg/s}$

A mysterious new particle Y has a mass which is 8 times the electron mass and has kinetic energy, $KE = 2m_e c^2$. It decays into another mysterious particle X and a photon with a wavelength of one compton wavelength.



1. What is the electron mass in MeV/c^2 and what is the compton wavelength in meters. (Ask me if you don't know this - some points will be deducted.)
2. Determine the energy and momentum of the photon.
3. Determine the energy and momentum of particle Y
4. Determine the mass of the final particle X .