Fusion in stars

1. The mass loss rate of our sun is 4.25×10^{12} g/s. How long will it take for the mass of the sun to decrease by 0.7%? (You will need to Google the mass of the sun for this question.) How much energy does the sun create each minute?

2. In helium burning, which reactions require the involvement of weak forces?

Radioactive Decay

3. Write the decay reactions for the following unstable isotopes.
   a. ^{146}Ce
   b. ^{14}O
   c. ^{130}Cs
   d. ^{241}Am
   e. ^{186}Pt
   f. ^{183}Hf

4. Cesium-137 has a half-life of 30.1 years. It emits a beta particle and a gamma ray (0.661 meV). What is your dose if you are 6.0 inches away from a pure 0.5 g cesium-137 source for 20 minutes?