Homework 9 - Schwarzschild metric

Q9.1. You synchronize two clocks and then throw one up into the air and catch it. Which clock will show the earlier time or will they show the same time?

Q9.2. A particle of mass m falls towards a Schwarzschild black hole of mass M. The particle is initially a great distance from the black hole and has energy $E = m$ and angular momentum L slightly greater than $mM/2\pi$. Describe qualitatively its trajectory.

Another particle falls under the same conditions except that its angular momentum is slightly smaller than $mM/2\pi$. Describe qualitatively its trajectory.