Astrophysics

Q 1. A comet is observed to have a perhelion of 0.1 au and its speed is 10 km/s at perhelion. Determine the eccentricity e and period P of the comet's orbit.

Q 3. A binary stellar system with two stars of mass $1\,M_\odot$ are in a cicular orbit with separation 1 AU between the stars. How close can the binary system approach a blackhole of mass $10^6\,M_\odot$ before the tidal force due to the blackhole exceeds the gravitational force between the two stars.