Practice with Universal Gravitation and Kepler's Law of Harmonies

On 2/12/01, the Project NEAR (Near Earth Asteroid Rendezvous) spacecraft landed on the surface of the asteroid Eros.

Spacecraft data:
mass = 805 kg

Eros data:
mass: 7.2×10^{15} kg
ave. diameter: 20.0 km
radius of orbit = 1.46 AU

Problems to solve:

1. Determine the orbital period of Eros.
2. Determine the force of gravitational attraction between the Sun and Eros
3. Determine the weight of the spacecraft on the surface of Eros.
4. Find the orbital period of the spacecraft at an orbital radius of 240 km.
5. Find the force of gravitational attraction between Eros and the spacecraft at the 240 km orbital radius.

Turn in:

Each ***lab group*** turns in one **neat** , well organized page showing formulas and computations for all steps. Calculations for each problem must be clearly labeled and show proper cancellation of units. Each result must be accompanied by proper units. Your team's page must be paperclipped to this handout when you turn it in.

Each ***student*** is to keep a copy of the team's calculations to study.