

NAME _____
PERIOD _____ DATE _____

PHYSICS QUIZ #18D
GRAVITATIONAL ENERGY

The moon Ganymede, which has a mass of 1.480×10^{22} kg and a radius of 2.63×10^6 m's, orbits the planet Jupiter once every 7.155 Earth days. [$m_{\text{Jupiter}} = 1.90 \times 10^{27}$ kg, $r_{\text{Jupiter}} = 7.14 \times 10^7$ m, $G = 6.67 \times 10^{-11}$ Nm²/kg², $c = 3.00 \times 10^8$ m/sec]

1. What is the velocity of Ganymede as it orbits Jupiter? [3 pts]

2. What is the radius of the orbit of Ganymede about Jupiter? [3 pts]

3. What is the gravitational force between Jupiter and Ganymede? [3 pts]

4. What will be the escape velocity of a rocket leaving the surface of Jupiter? [3 pts]

5. With what velocity should a rocket leave the surface of Jupiter, if the velocity of the rocket is to be 35,000 m/sec when the rocket is very far from Jupiter? [3 pts]