Physics Work

1. Jupiter's moon Ganymede has a mass of 1.48×10^{23} kg and a diameter of 5268 km. What is its gravitational field strength at its surface?

$\frac{GM}{r^2} =$ gravitational field strength

$\frac{6.67 \times 10^{-11} \times 1.48 \times 10^{23}}{2634000^2} =$

$\boxed{1.42 \text{ N/kg}}$

6. Titania is a moon that orbits the planet Uranus. The mass of Titania is 3.5×10^{21} kg and its radius is $800.$ km. Use the given data to calculate the gravitational potential at the surface of Titania, and calculate the escape velocity for Titania.

$\frac{-GM}{r}$

$\frac{-6.67 \times 10^{-11} \times 3.50 \times 10^{21}}{800000}$

$\boxed{\text{-292,000 J/kg}}$

$v_e = \sqrt{\frac{2GM}{r}}$

$= \sqrt{\frac{2 \times 6.67 \times 10^{-11} \times 3.50 \times 10^{21}}{800000}}$

$\boxed{763 \text{ m/s}}$

10. Determine the gravitational potential, blah blah blah

$U = \frac{-GmM}{r}$

$\frac{-6.67 \times 10^{-11} \times 5.98 \times 10^{24} \times 913}{35032 + 6280}$

$\boxed{8{,}810{,}000{,}000 \text{ J/kg}}$

11. Two spheres, A and B, of 625.4 and 404.1, blah blah blah

$F = \frac{GmM}{r^2}$

$= \frac{6.67 \times 10^{-11} \times 625.4 \times 404.1}{0.2624^2}$

$\boxed{0.245 \text{ N}}$