* Show all work to get answers

Universal Gravitation

1. What gravitational attraction does the moon have for a 70 kg person on earth? (mass of earth=5.97 x 10^{24} kg, mass of moon=7.4 x 10^{22} kg, and distance between earth and moon is 3.8 x 10^{8} m. Compare this with the earth's gravitational force on a 70 kg person.

0.024
686

2. How much does an astronaut weigh on Venus if he weighs 800N on earth? (Mass of Venus= 4.88 x 10^{24} kg, radius of Venus=6.05 x 10^{6} m)

725.6

3. What is the force of gravity on a 1000 kg satellite which is 1000 km above the earth's surface. Compare that with the **weight** of the satellite **on the surface.** (Radius of Earth = 6.37 x 10^{6} m, mass of earth = 5.98 x 10^{24} kg)

7343.3

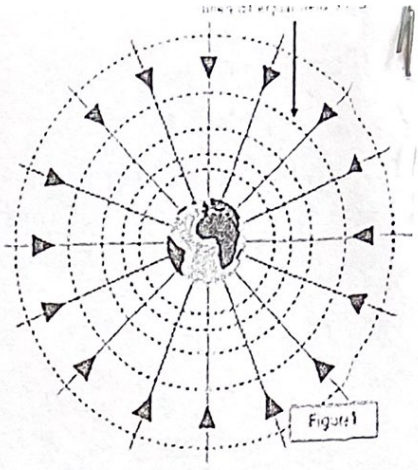
4. Find the velocity that the satellite in #3 needs to move at to stay in orbit at this altitude.

7356.6

5. Find the acceleration of gravity on the moon of Jupiter named Io. The radius of Io is 1.7 x 10^{6} m and the mass of Io is 7.87 x 10^{22}kg.

1.8

Worksheet 5.4 – Gravitational Field Strength



$G = 6.67 \times 10^{-11}$ N m^2 kg^{-2}, mass of the Earth = 6.0×10^{24} kg, Radius of the Earth = 6.4×10^{6} m.

9.8 1) Calculate the gravitational field strength on the surface of the earth.

2) Calculate the gravitational field strength Mr. Lawson would generate if he had the same radius of the Earth. (Oh by the way I weigh 80.0 kg)

3) Based on your answers to Q 1 and 2… explain why the Earth and I exert the SAME force on one another…

3.6 4) Calculate the gravitational field strength on the surface of Mars. Mars has a radius of 3.43×10^{6} m and a mass of 6.37×10^{23} kg.

9.9×10^{5} 5) At what distance from Earth's surface is the acceleration due to gravity 7.33 m/s^2?

2.8 6) On the surface of Planet X an object has a mass of 22.5 kg and a weighs 63.5 N. What is the gravitational field strength on the surface?

1.39×10^{7} 7) On the surface of Planet Y, which has a mass of 4.83×10^{24} kg, a 30.0 kg object weighs 50.0 N. What is the radius of the planet?