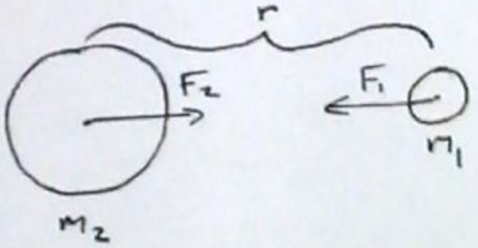
Newton's Law of Universal Gravitation

$$F_{Gravity} = \frac{m_1 m_2 G}{r^2} \qquad G = 6.67 \times 10^{-11} \frac{N \cdot m^2}{kg^2}$$



$$F_1 = F_2 = G \frac{m_1 \cdot m_2}{r^2}$$

$$F_g = mg$$

$$F_G = F_g$$

$$\frac{G \cancel{m_1} m_2}{r^2} = \cancel{m_1} g$$

$$g = G \frac{M_2}{r^2}$$

1.) What happens to F_g if you double m_1?

2.) what happens to F_g if you double r?

3.) The dwarf planet of Pluto has $1/500$ the mass and $1/15$ the radius of Earth. What is 'g' on the surface of pluto? ('g' on Earth is $10\ m/s/s$).

4.) Given that the radius of the earth is 6.37×10^6 meters, calculate the mass of the earth. $g = 9.8\ m/s/s$

5.) A 100 kg mass is 4 meters from a 210 kg mass. What is the mutual force of attraction between the two?

6.) A hypothetical planet has a mass $1/5$ of the earth and a radius of $1/2$ the earth. What is 'g' on the surface of the planet? ('g' of the earth is $10\ m/s/s$)