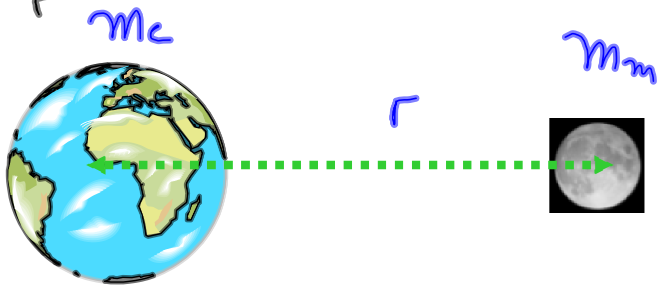
$$F = G\frac{m_1 m_2}{r^2}$$



IF YOU DOUBLE THE MASS OF THE MOON – BY HOW MUCH WILL THE FORCE BETWEEN THE EARTH & MOON BE CHANGED?

$$F = G\frac{m_e m_m}{r^2} \qquad G \neq g$$

G ← UNIVERSAL GRAVITATIONAL CONSTANT

g ← acceleration of gravity on earth

$$F_0 = G\frac{m_e m_m}{r^2} = \frac{(1)(1)}{(1)} = (1)$$

$$F_N = \longrightarrow \frac{(2)(2)}{(2)^2} = (1)$$

Say:

DOUBLE MASS OF MOON.

reduce separation by half.

$$F_0 = \frac{(1)(1)}{(1)} = 1$$

$$F_N = \frac{(2)(1)}{(1/2)^2} = \frac{2}{\left(\frac{1}{4}\right)} = 8$$

Nov 10-9:38 AM

$G \neq g = -9.81\ m/s^2$

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

G = UNIVERSAL GRAVITATION CONSTANT

$$= 6.67 \times 10^{-11} \frac{(N)(m^2)}{(kg)^2}$$

$m_1 = 8.9 \times 10^{22}\ kg$

$r = 1.815 \times 10^{6}\ m$

$m_2 = 50\ kg$

$$F = \frac{(6.67)(10^{-11})(8.9)(10^{22})(50)}{(1.815 \times 10^{6})^2} = \frac{(2968.15)(10^{11})}{(3.29)(10^{12})}$$

$$= 902.17 \times 10^{-1} \approx 90.2\ [N]$$