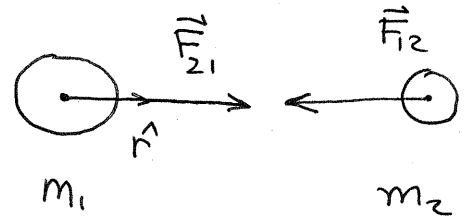


GRAVITATION

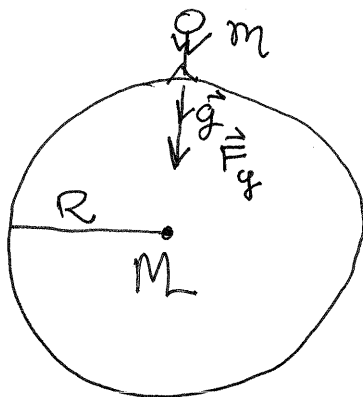
$$\vec{F}_{21} = \frac{G m_1 m_2}{r^2} \hat{r}$$



$\vec{F}_{21} \equiv$ Force on 1 due to 2 "Force of 2 on 1"

$\vec{F}_{12} \equiv$ Force on 2 due to 1 "Force of 1 on 2"

$$\vec{F}_{12} = -\vec{F}_{21} \quad \text{NEWTON'S THIRD LAW}$$



$$\vec{F} = m\vec{g}$$

$$|\vec{F}| = m|\vec{g}| = \frac{GMm}{R^2}$$

$$\Rightarrow \boxed{g = \frac{GM}{R^2}}$$

for any Planet

$$\frac{g_2}{g_1} = \frac{GM_2}{R_2^2} \cdot \frac{R_1^2}{GM_1} = \frac{M_2}{M_1} \cdot \left(\frac{R_1}{R_2} \right)^2$$