GRAVITATION

Force due to gravity

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

$m_1 m_2$ → product of mass

G → Gravitational const.

r → distance btw masses

$$G = 6.67 \times 10^{-11}\ Nm^2/kg^2$$

→ Same in all mediums [FORCE]

→ ~~Conservative force~~

→ along the line joining

→ equal and opposite forces

$$M_e = 6 \times 10^{24}\ kg$$

$$R_e = 6400\ km$$

} Earth

Vector form;

$$\vec{F} = -\frac{G m_1 m_2}{|r|^3}\vec{r}$$

$$\vec{r} = \vec{r}_2 - \vec{r}_1$$

$mg = F$

$$g = F/m$$

mass →

$$g = \frac{GM}{r^2}$$

g → a/c due to gravity

$$g = 9.81\ m/s^2$$

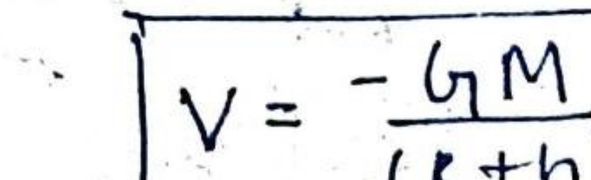
$$g = \frac{(6.67 \times 10^{-11})(M_e)}{(r_e)^2}$$

$$g = 9.8\ m/s^2$$

Potential (Energy)

$$U = -\frac{GM_1M_2}{r}$$

$$U = 0 \quad r \to \infty$$



Gravitation potential

$$V = U/m$$

$$V = -\frac{GM}{r}$$

$$V = -\frac{GM}{(R+h)}$$

$$r = R + h$$