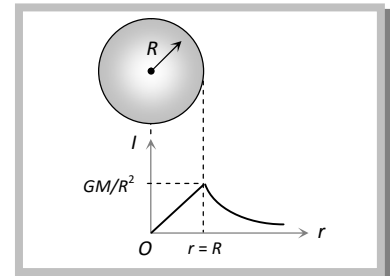# Gravitational Field Intensity for Different Bodies.

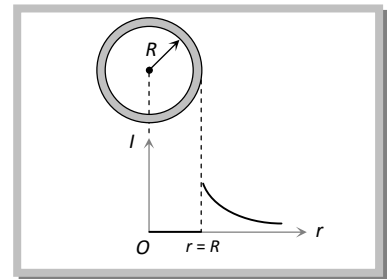(1) Intensity due to uniform solid sphere

Outside the surface	On the surface	Inside the surface
r > R	r = R	r < R
$I = \dfrac{GM}{r^2}$	$I = \dfrac{GM}{R^2}$	$I = \dfrac{GMr}{R^3}$

(2) Intensity due to spherical shell

Outside the surface	On the surface	Inside the surface
r > R	r = R	r < R
$I = \dfrac{GM}{r^2}$	$I = \dfrac{GM}{R^2}$	I = 0

(3) Intensity due to uniform circular ring

At a point on its axis	At the center of the ring
$I = \dfrac{GMr}{(a^2 + r^2)^{3/2}}$	I = 0
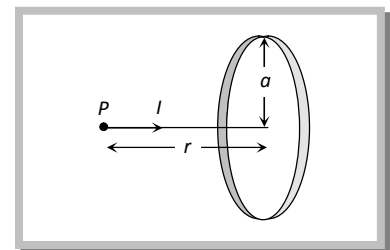
(4) Intensity due to uniform disc

At a point on its axis	At the center of the disc
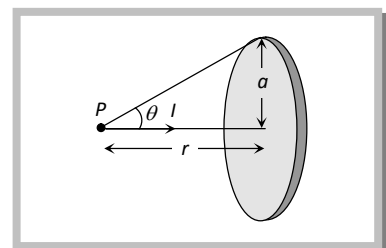
$$I = \frac{2GMr}{a^2}\left[\frac{1}{r} - \frac{1}{\sqrt{r^2 + a^2}}\right]$$ or $$I = \frac{2GM}{a^2}(1 - \cos\theta)$$	I = 0