$$a = (g - a_0)$$

$$V^2 = u^2 + 2as$$

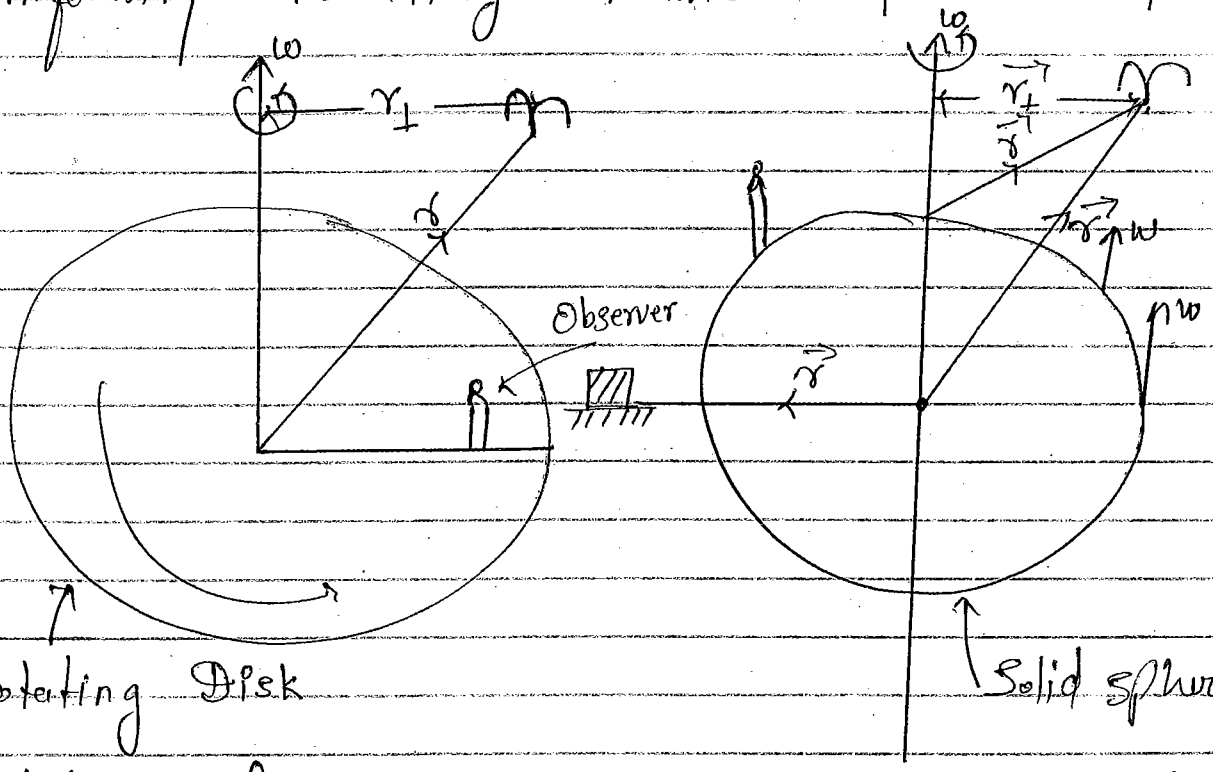
$$V^2 = 0 + 2(g - a_0) \times 10$$

$$= 2 \times 6 \times 10$$

$$V^2 = 120$$

$$\boxed{V = \sqrt{120}\ m/sec}$$ Ans

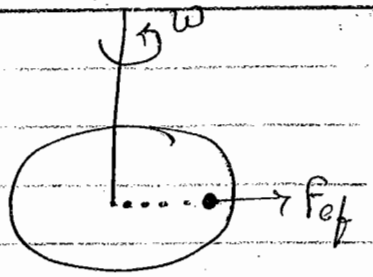
* Uniformly Rotating frame :- {ω = Constt} :-



Rotating frame is example of Non-Inertial frame.

When observation is made from rotating frame on all objects (irrespective of their location) following pseudo forces appears to act on them.

1. Centrifugal force :-



$$\boxed{f_{cf} = -m\vec{\omega} \times (\vec{\omega} \times \vec{r})}$$

m = mass of object.
$\vec{\omega}$ = angular velocity of rotating frame
$\vec{r}$ = position vector of object (with respect to a statimary point of frame).

Magnitude of Centrifugal force :-

$$\boxed{\vec{f_{cf}} = m\omega^2 r_\perp}$$

$r_\perp$ = $\perp^{or}$ distance of object from axis of rotation.

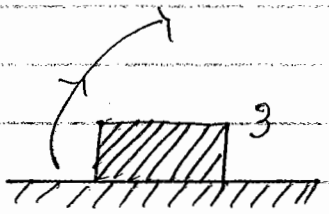
⇒ Centrifugal force acts on all object irrespective of their state of motion.

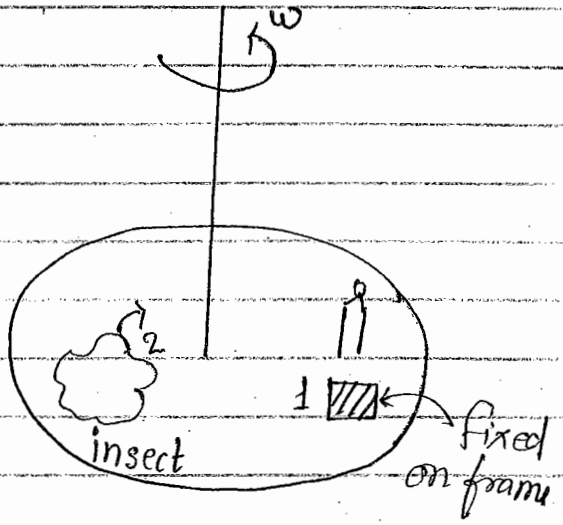
2. Coriolis force :-

Coriolis :- A name of Mechanical Engineer Coriolis was a mechanical engineer. He is observing force on the liquid which is in rotating arm of the machine and unfortunately he discover a different type of force which is after his name k/a coriolis force.

"This force is appears to act on all object which appear to be moving when seen from the rotating frame (or object have speed with respect to rotating frame.)"

Here Coriolis force act on object 2 & 3 but not on 1.





Expression of Coriolis force :-

$$\vec{F}_{cor.} = -2m(\vec{\omega} \times \vec{v}_r)$$

v_r = Velocity of object with respect to rotating frame

$$\boxed{\vec{F}_{cor} = 2m(\vec{v}_r \times \vec{\omega})}$$

* Some Basic Problems Based on Coriolis force :-

A-5
2.22 A circular platform is rotating with a uniform angular speed ω counterclockwise about an axis passing through its center and perpendicular to its plane as shown in the figure. A person of mass m walks radially inwards with a uniform speed v on the plateform. The magnitude and the direction of the coriollis force (with respect to the direction along which the person walks is ?