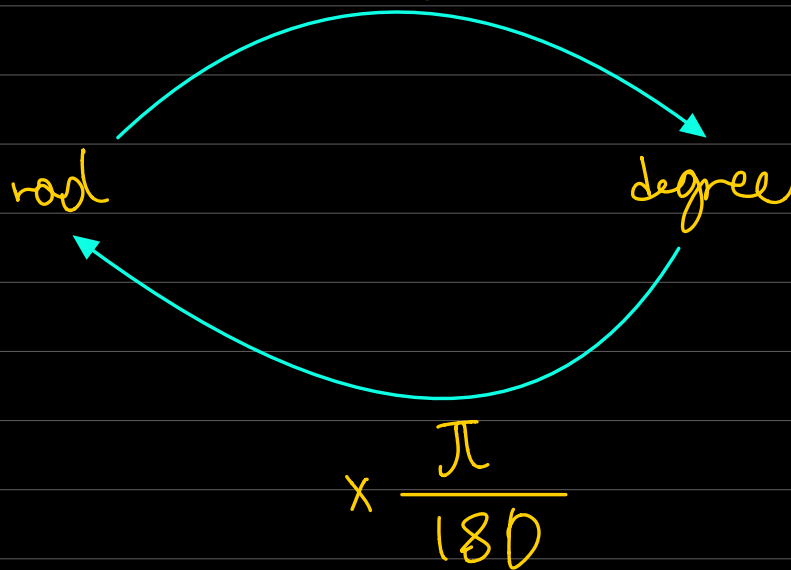


- 1 rad is defined as the ^{center} angle subtended by an arc when the length of the arc is equal to the radius of the circle

$$s = r\theta$$

$$\times \frac{180}{\pi}$$



$$\downarrow (\text{rad s}^{-1})$$

- Angular speed is the angle swept out by the radius per unit time

$$\downarrow (\text{rad s}^{-1})$$

- Angular velocity is the angular speed in a given direction (eg. clockwise)

$$\text{angular speed } (\omega) = \frac{\Delta \theta}{\Delta t}$$

$$\text{linear velocity in circular motion } (v) = r\omega$$

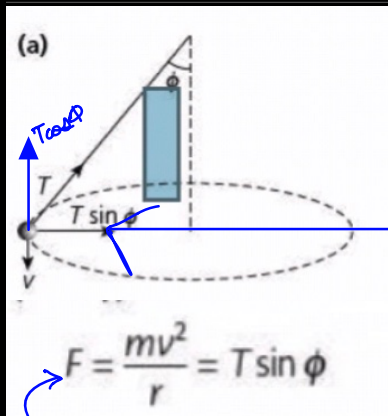
- An object in circular motion is not in equilibrium because there is a resultant force acting on it (centripetal force) as it has an acceleration.

because the direction of velocity keeps changing which means velocity is changing

- An object in circular motion is always accelerating towards the center, this acceleration is called centripetal acceleration, and because there is acceleration there must be a force causing this, and that resultant force is called centripetal force, and it also acts towards the center.

$$\text{centripetal acceleration} = \frac{v^2}{r} = \frac{r \cancel{r} \omega^2}{\cancel{r}} = \underline{\underline{r \omega^2}}$$

$$\text{centripetal force} = \frac{mv^2}{r} = \frac{m(r \cancel{r} \omega^2)}{\cancel{r}} = \underline{\underline{mr \omega^2}}$$



This is sin as opposite to the angle ϕ

centripetal