



PAPPUS & GULDINUS THEOREMS

Two Theorems developed by Greek scientist Pappus & Swiss Mathematician Guldinus, to determine surface area & Volume of bodies (or) to locate centroid of bodies.

THEOREM I:

It states that "area of surface of revolution is the product of the length of generating curve & the distance travelled by the centroid of curve while surface is generated".

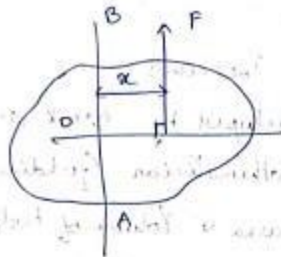
THEOREM II:

It states that "Volume of a body of revolution is obtained from the product of the generating area & the distance travelled by the centroid of the area, while the body is being generated".

MOMENT OF INERTIA:

Moment of Inertia about a point is the product of its Magnitude & its distance b/w the line of action of force and point about which force causing rotation.

$$M_0 = F \times x$$



This moment is called as first moment of force about point 'O'. Let it be M_{O1}

→ If we multiply the moment again with α then we get moment of moment of force or Second moment of force, it is also called as Moment of Inertia (M_{O2})

Moment of Inertia $M_{O2} = \text{First Moment} \times \text{distance}$

$$= M_{O1} \times \alpha$$
$$= (F \times \alpha) \times \alpha$$
$$= F \alpha^2$$

Moment of Inertia also known as "area moment of inertia" denoted by mmt .

→ MOI denoted by I carries the symbol of the axes about which it is calculated (I_{AB}).

→ MOI about unparallel axes are denoted by I_{xx} or I_{yy} .

→ MOI of a body about an axis passing through center of gravity is denoted by I_{cg} .