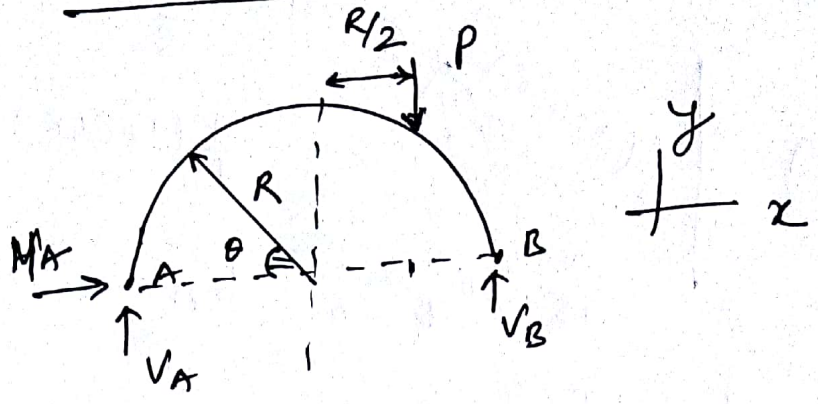
Quiz - 4

* Que-1

FBD



$-\Sigma F_x = 0;$

$M_A = 0$

$-\Sigma F_y = 0;$

$V_A + V_B = P$

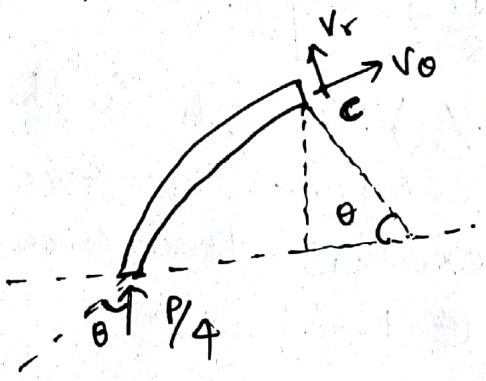
$-\Sigma M_A = 0;$ → Taking moment about A;

$-V_B \times 2R + P \times (R + R/2) = 0;$

$V_B = \frac{3PR}{2} \times (1/2R);$ $\boxed{V_B = \frac{3P}{4}}$

$\boxed{V_A = P/4}$

⇒ Take left half section;



$V_r = -P/4 \sin\theta$

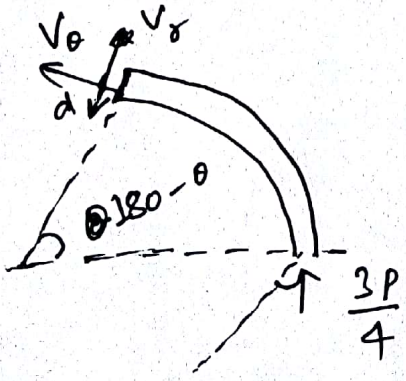
$V_\theta = -P/4 \cos\theta$

- moment about point C,

$M_C = \frac{P}{4}(R - R\cos\theta);$

$\boxed{M_C = P/4 \cdot (1 - \cos\theta) \cdot R}$

⇒ Take right half section.



$V_r = \frac{3P}{4} \sin\theta$

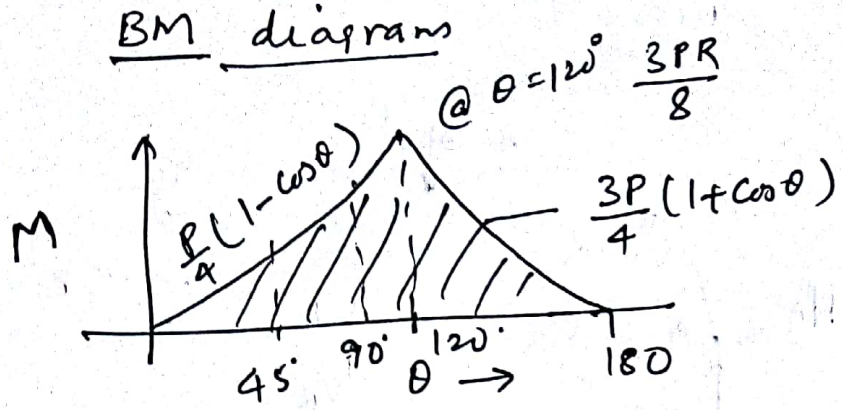
$V_\theta = \frac{3P}{4} \cos\theta$

- moment about point d,

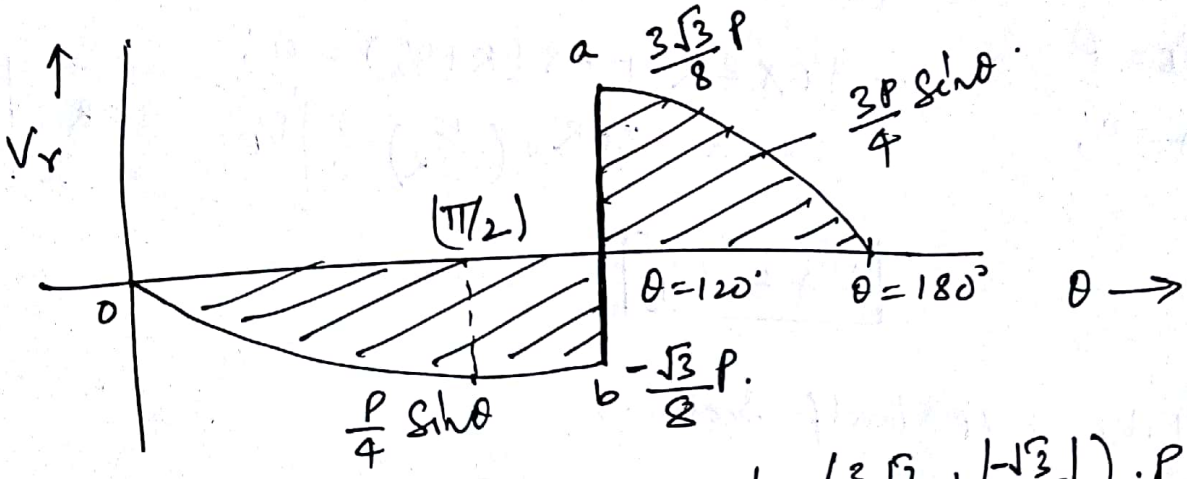
$M_d = \frac{3P}{4}(R - R\cos(180-\theta))$

$\boxed{M_d = \frac{3PR}{4}(1 + \cos\theta)}$ P.T.O.

BM diagram

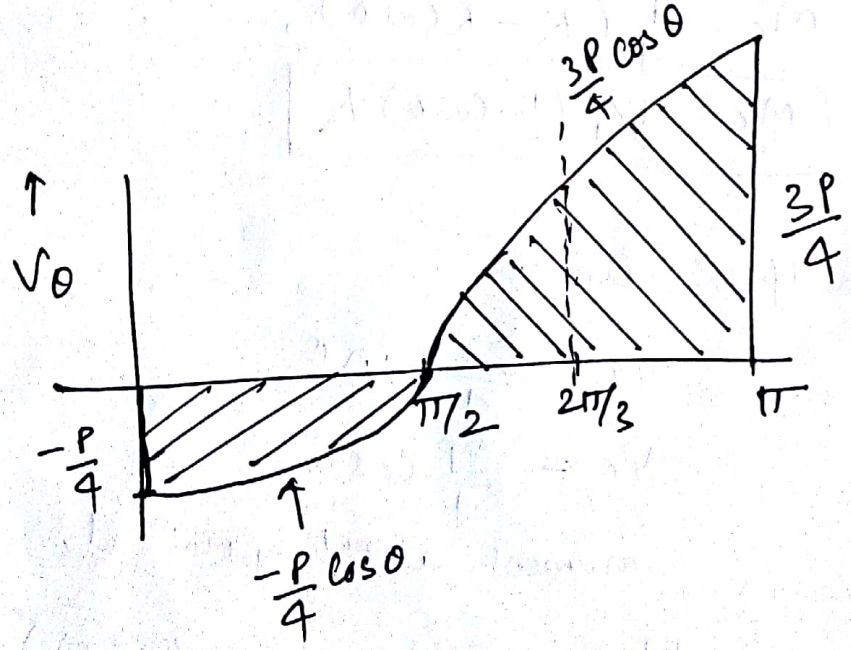


Shear force Diagram



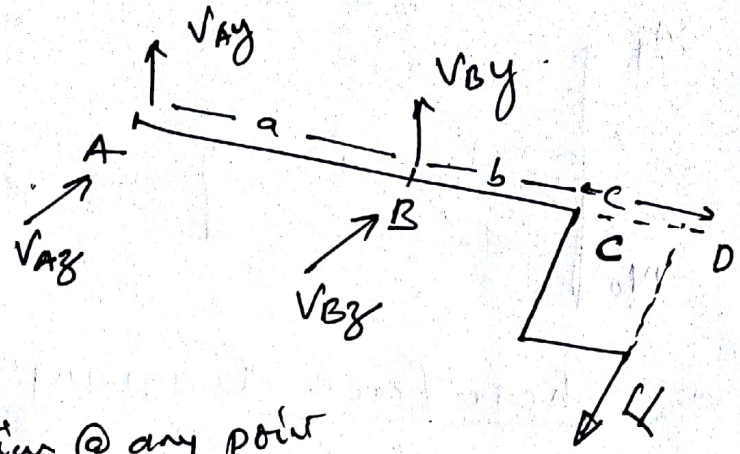
$ab = \left(\frac{3\sqrt{3}}{8} + \left|\frac{-\sqrt{3}}{8}\right|\right) \cdot P$

$= \left(\sqrt{3}/2\right)$. which is the component of force P exerting. shear force @ 120°.



Quiz-4

Que- 2 **FBD**



$\Rightarrow \Sigma F_y = 0;$

$V_{Ay} + V_{By} = 0;$

From method of section @ any point

lets take @ (A).

$V_{Ay} = 0;$ similarly $V_{By} = 0;$

$\Rightarrow \Sigma F_z = 0;$

$V_{Az} + V_{Bz} = F$

$\Rightarrow$ Taking moment about A, $\Sigma M_A = 0;$

$-F \times (a+b+c) + V_{Bz} \times a = 0;$

$$\boxed{V_{Bz} = F\left(\frac{a+b+c}{a}\right)}$$

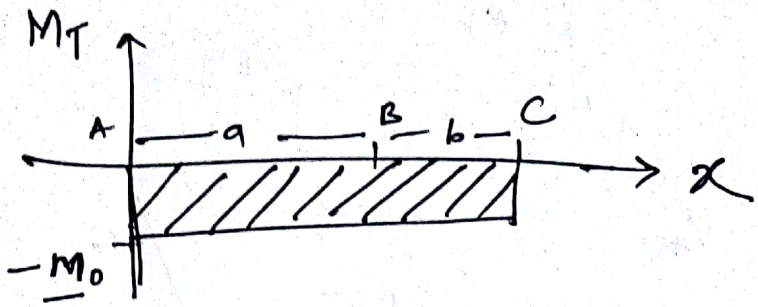
$$\boxed{V_{Az} = F\left(\frac{b+c}{a}\right)}$$

$\Rightarrow$ Twisting moment about an axis x.

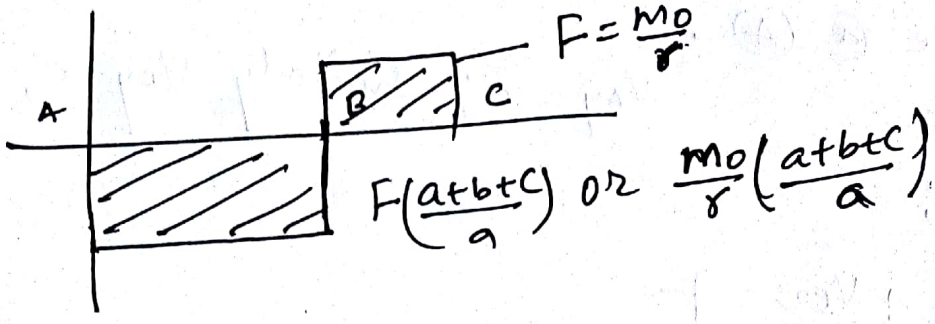
$M_t = F \times r = M_0$; $\boxed{F = \frac{M_0}{r}}$.

P.T.O.

— Twisting moment diagram



— Shear force diagram



— Bending Moment diagram