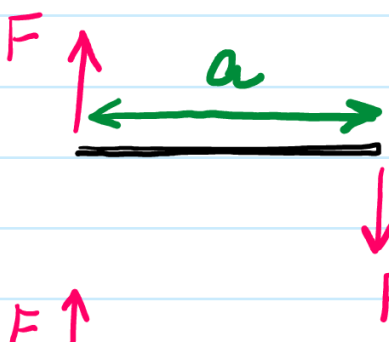
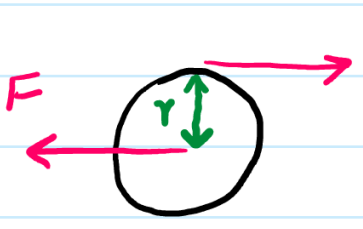
16 November 2020 09:19

Concept of Turning effect of a "COUPLE" also called Torque of a "COUPLE"

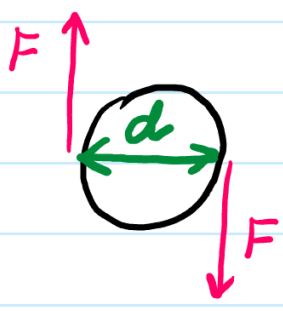
define the term Couple :. Couple refers to TWO EQUAL and antiparallel forces acting on an object at different points



Fxa



Fxr



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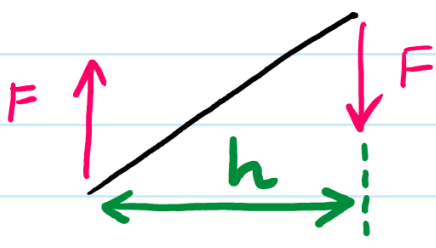
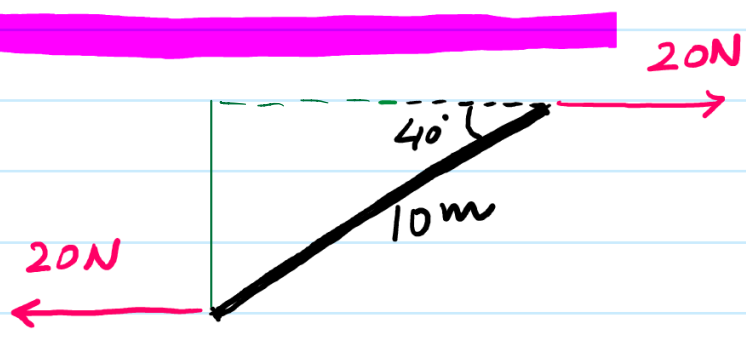


Fxh

done till here.

How to calculate Turning effect of a couple also called Torque of a couple.

Torque of a Couple = Any one force multiplied by the perpendicular distance b/w the two forces.

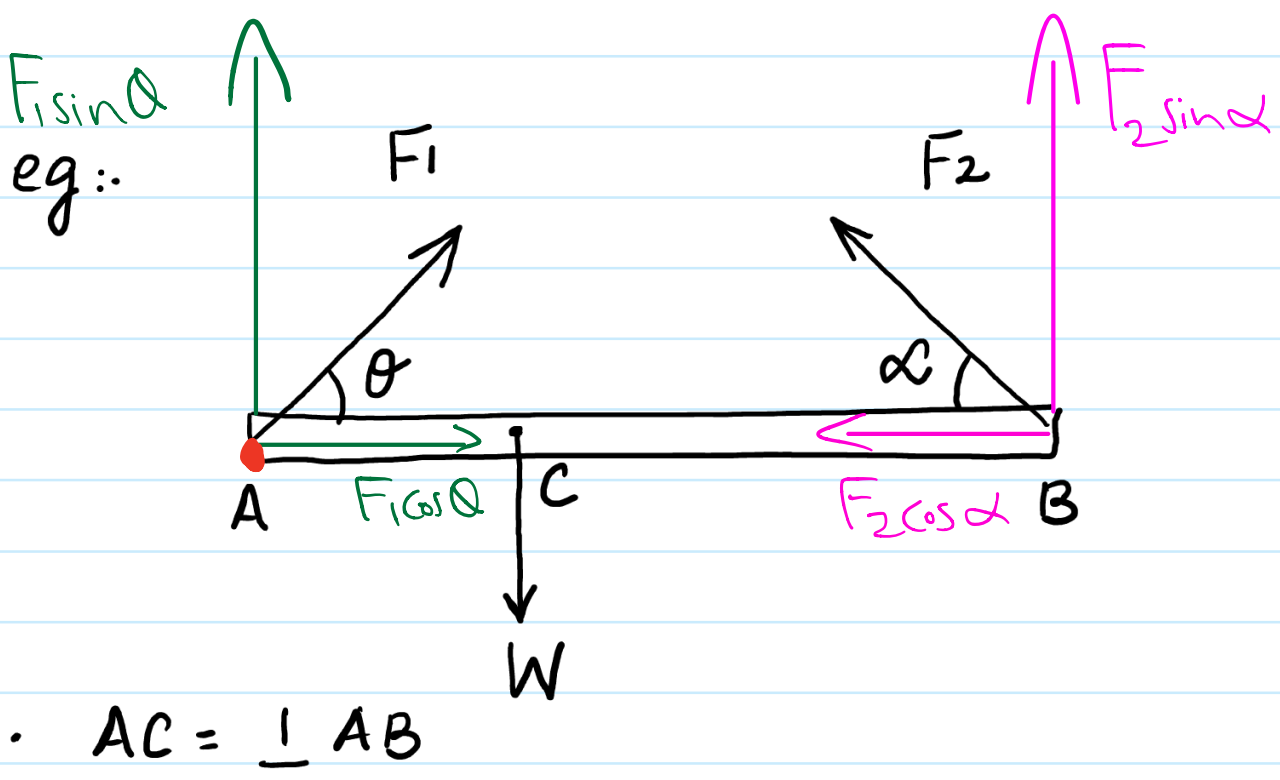


$\sin 40° = \frac{d}{10}$

$d = 10 \sin 40$

Cal Torque of a Couple.

$20 \times 10 \sin 40$



- $AC = \frac{1}{3} AB$
- Given that rod is in EQ.

(i) form an Equation only in terms of Forces (in the vertical plane)

$$F_2 \sin\alpha + F_1 \sin\theta = W$$

(ii) form an Equation only in terms of Forces (in the horizontal plane)

$$F_1 \cos\theta = F_2 \cos\alpha$$

(iii) form an Equation by applying Principle of moments about the point A.

Taking A as pivot

$W \times AC = F_2 \sin\alpha \times AB$

CW ACW

$W \times \frac{1}{3} \cancel{AB} = F_2 \sin\alpha \times \cancel{AB}$

$$\boxed{W = 3 \times F_2 \sin\alpha}$$