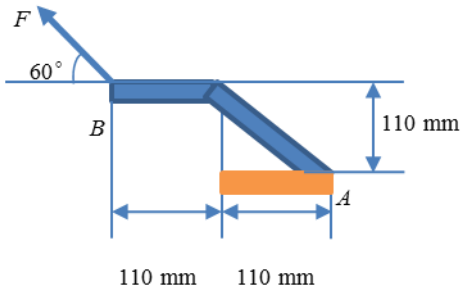
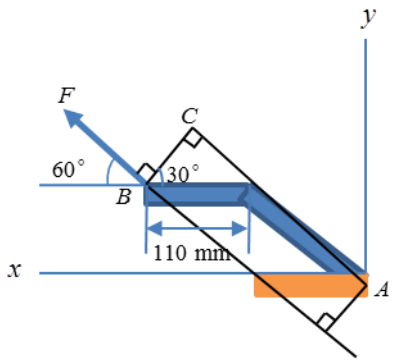
9. A force F follows a normal distribution $F \sim N(300, 5^2)$ N , and it acts on the bracket as shown. Determine the distribution of the moment of F about point A.



Solution



$$CB = d = 110\cos 30^\circ = 0.095 \text{ m}$$

We know $F \sim N(300, 5^2)$ N, so the μ_{M_A} and σ_{M_A} of the moment of the force about point A are

$$M_A = Fd$$
$$\mu_{M_A} = \mu_F d = 300(0.095) = 28.5 \text{ N·m}$$
$$\sigma_{M_A} = \sigma_F d = 5(0.095) = 0.475 \text{ N·m}$$

Thus, the distribution of M_A is $M_A \sim N(28.5, 0.475^2)$ N·m, clockwise. **Ans.**