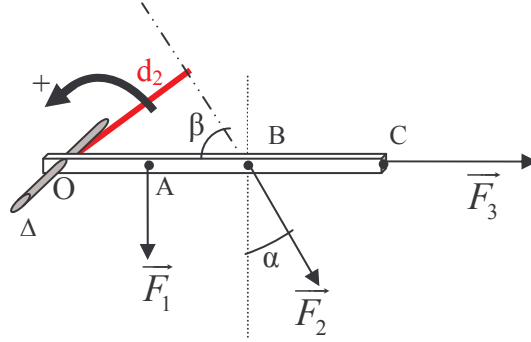


حل التمرين 04



$$M_{\Delta}(\vec{F}_1) = -F_1 \cdot OA \Rightarrow M_{\Delta}(\vec{F}_1) = -17 \times 16 \cdot 10^{-2} = -272 \text{ N} \cdot \text{m} \quad .1$$

$$M_{\Delta}(\vec{F}_2) = -F_2 \times d_2$$

$$\sin \beta = \frac{d_2}{OB} \Rightarrow d_2 = OB \sin \beta$$

$$\beta = \frac{\pi}{2} - \alpha \Rightarrow \sin \beta = \cos \alpha \Rightarrow M_{\Delta}(\vec{F}_2) = -F_2 \times OB \cdot \cos \alpha$$

$$M_{\Delta}(\vec{F}_2) = 8 \text{ N} \cdot \text{m}$$

$$M_{\Delta}(\vec{F}_3) = 0 \quad \text{لأن اتجاه هذه القوة يتقاطع مع المحور } \Delta .$$

$$\sum M_{\Delta}(\vec{F}) = M_{\Delta}(\vec{F}_1) + M_{\Delta}(\vec{F}_2) + M_{\Delta}(\vec{F}_3) = -264 \text{ N} \cdot \text{m} \quad .2$$