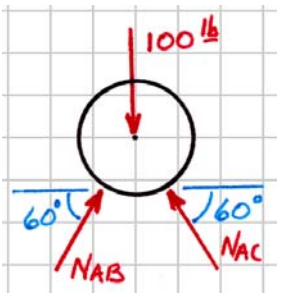
1-21

A free-body diagram of cylinder A gives

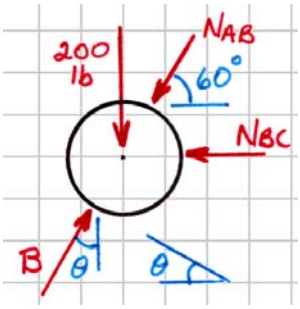


$$\rightarrow \Sigma F_x = 0: \qquad N_{AB}\cos 60° - N_{AC}\cos 60° = 0$$

$$\uparrow \Sigma F_y = 0: \qquad N_{AB}\sin 60° + N_{AC}\sin 60° - 100 = 0$$

$$N_{AB} = N_{AC} = 57.73503 \text{ lb}$$

Then, from a free-body diagram of cylinder B



$$\rightarrow \Sigma F_x = 0: \qquad B\sin\theta - N_{AB}\cos 60° - N_{BC} = 0$$

$$\uparrow \Sigma F_y = 0: \qquad B\cos\theta - N_{AB}\sin 60° - 200 = 0$$

The minimum force occurs when $N_{BC} = 0$, therefore

$$\frac{B\sin\theta}{B\cos\theta} = \tan\theta = \frac{N_{AB}\cos 60°}{N_{AB}\sin 60° + 200}$$

$\theta = 6.59°$ ..... **Ans.**