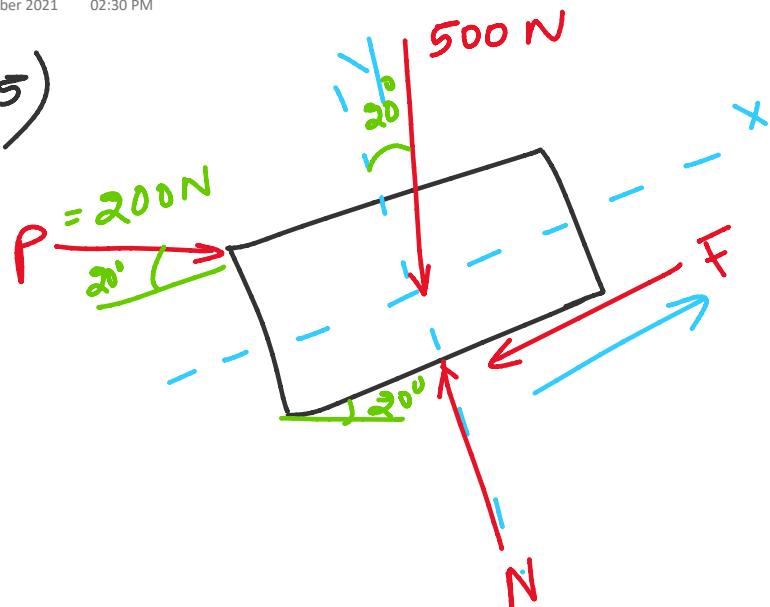


NS)



$$\sum F_y = 0; N - 500 \cos 20^\circ - 200 \sin 20^\circ = 0$$

$$N = 538.25 \text{ N}$$

$$F_{\max} = \mu N$$

$$= 0.3 \times 538.25$$

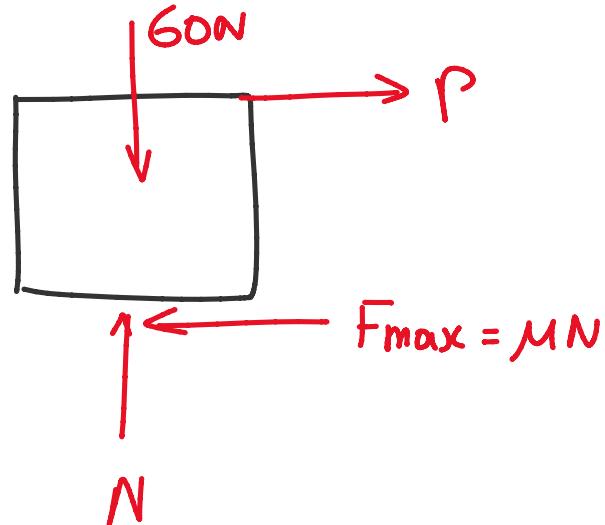
$$= \underline{\underline{161.47 \text{ N}}}$$

$$\sum F_x = 0; 200 \cos 20^\circ - 500 \sin 20^\circ - F = 0$$

$$F = 16.94 \text{ N}$$

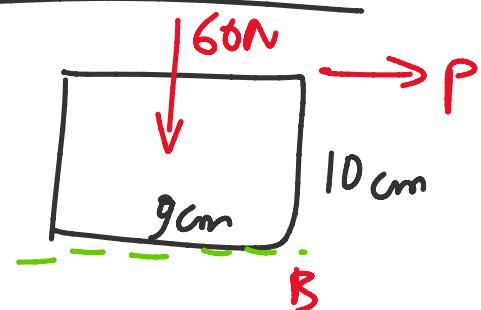
$< F_{\max}$

W6)

i) Fictional force concept

$$\sum F_y = 0 ; \boxed{N = 60N}$$

$$\begin{aligned} \sum F_x = 0 ; \quad P &= \mu N \\ &= 0.5 \times 60 \\ \boxed{P} &= 30N \end{aligned}$$

ii) Moment Concept

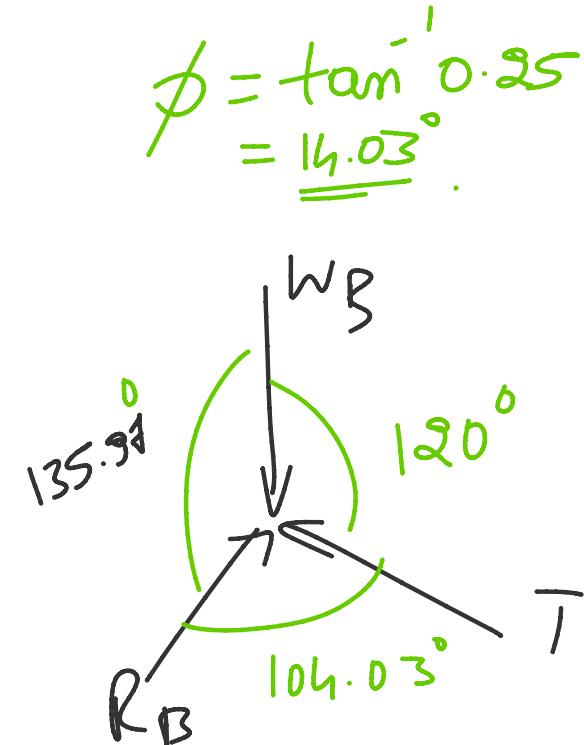
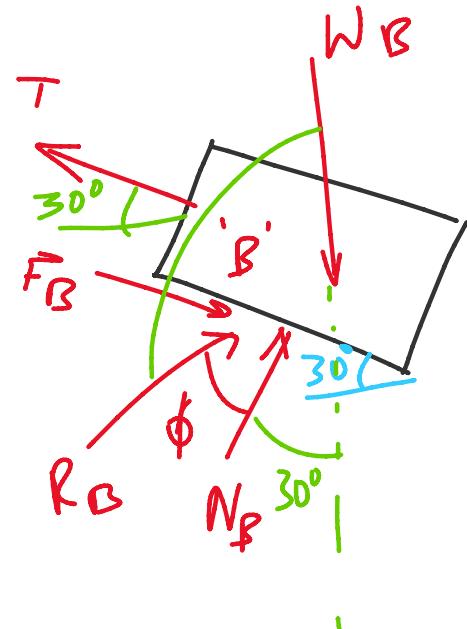
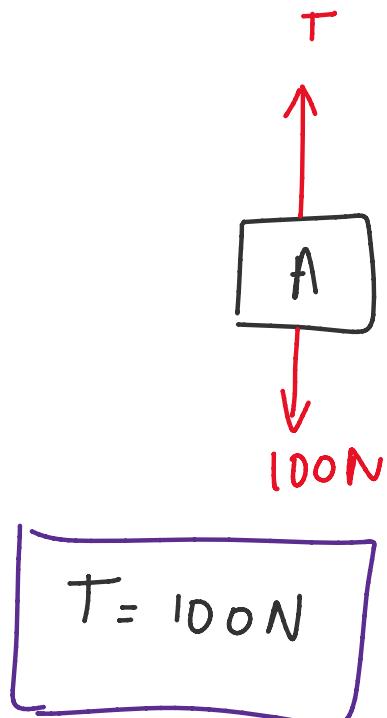
Assuming tipping at 'B'

$$\sum M_B = 0 ; -P \times 10 + 60 \times 4.5 = 0$$

$$\boxed{P = 27N}$$

✓

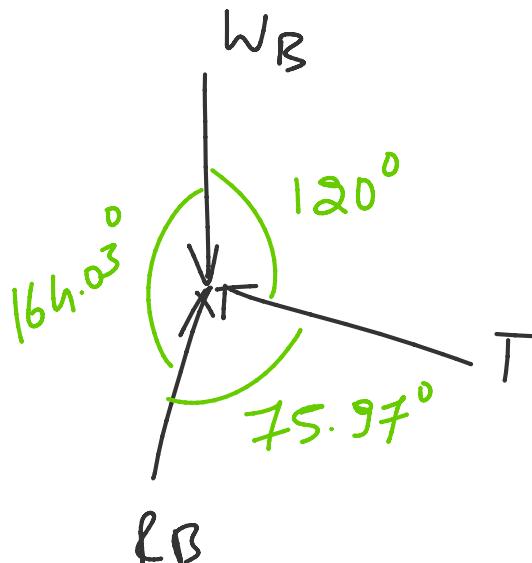
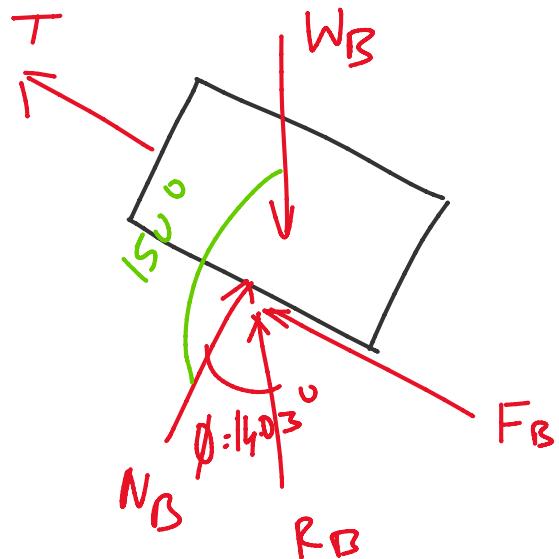
N7) Smallest value of 'B' (w_B)



$$\frac{100}{\sin 135.97^\circ} = \frac{w_B}{\sin 104.03^\circ}$$

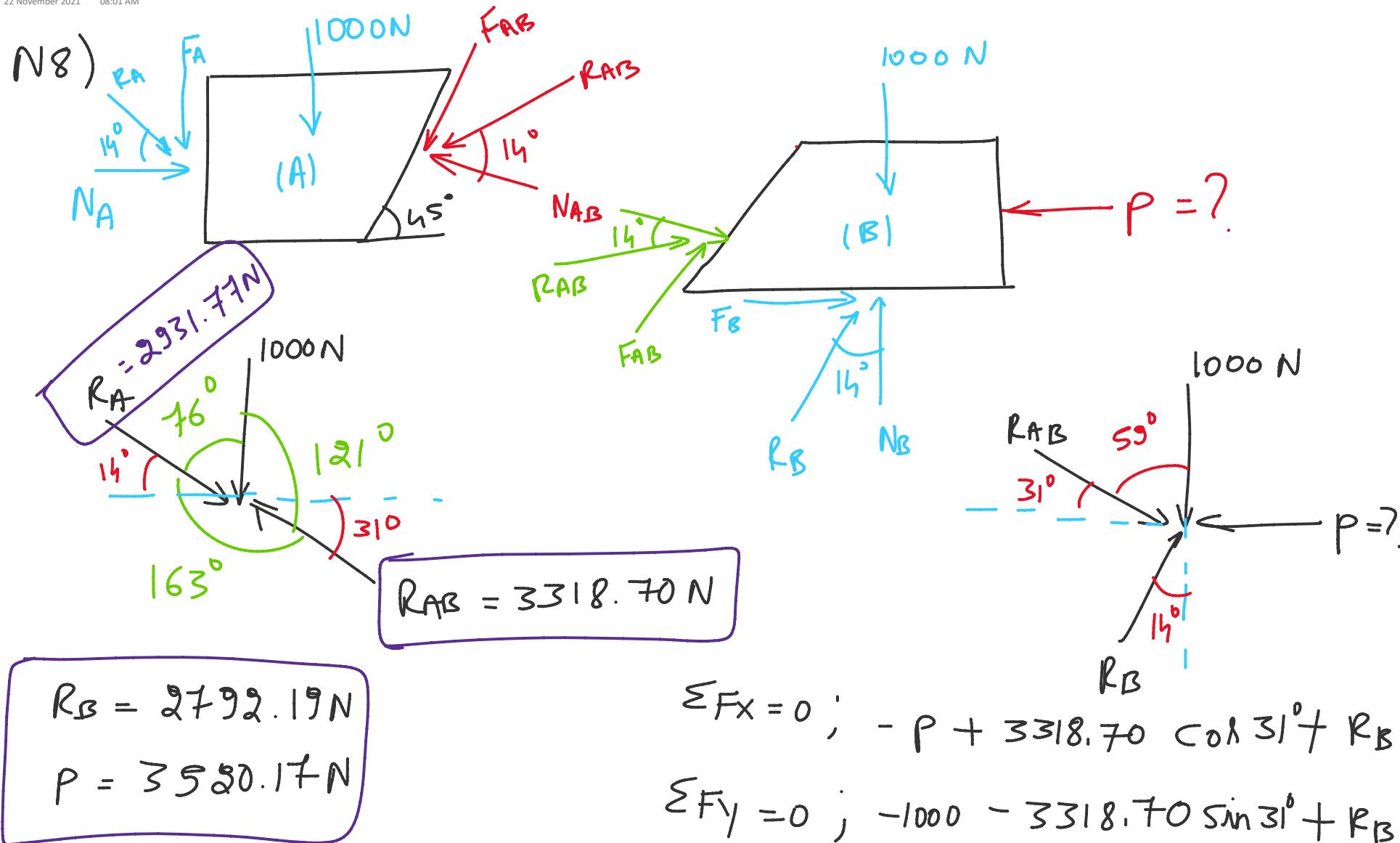
$w_B = 139.58N$

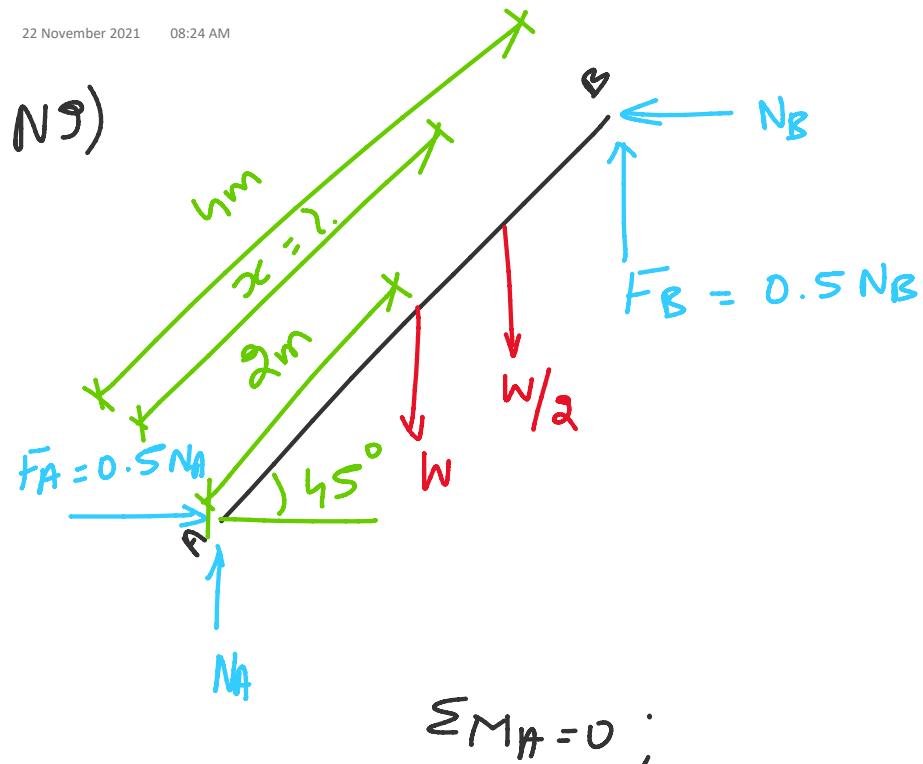
ii) Largest value of B' (w_B)



$$\frac{T = 100}{\sin 164.03^\circ} = \frac{w_B}{\sin 75.97^\circ}$$

$$w_B = 352.74 \text{ N}$$





$$\sum F_x = 0 ;$$

$$0.5 N_A = N_B$$

$$N_A = 2 N_B$$

$$\sum F_y = 0 ;$$

$$N_A - W - \frac{W}{2} + 0.5 N_B = 0$$

$$N_A - \frac{3W}{2} + 0.5 N_B = 0$$

$$N_A = 1.2 W$$

$$N_B = 0.6 W$$

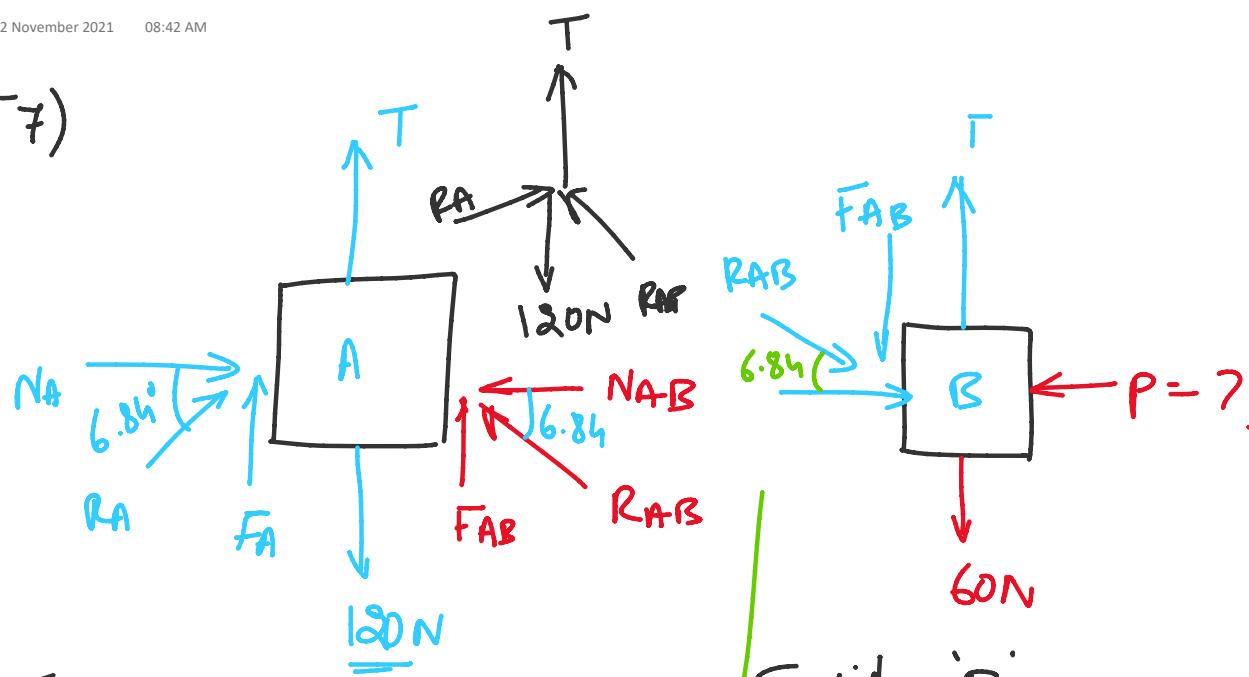
$$\sum M_A = 0 ;$$

$$N_B \times h \sin 45^\circ + 0.5 N_B \times h \cos 45^\circ$$

$$- \frac{W}{2} \times x \cos 45^\circ - W \times 2 \cos 45^\circ = 0$$

$$x = 3.2 m$$

T7)



Consider 'A'

$$\sum F_x = 0; R_A \cos 6.84^\circ - R_{AB} \cos 6.84^\circ = 0$$

$$R_A = R_{AB} \quad (3)$$

Consider 'B'

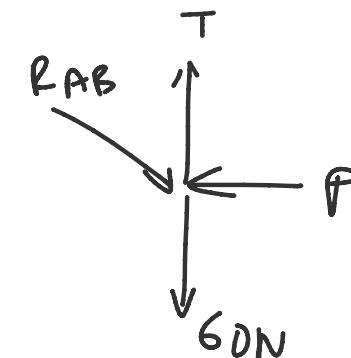
$$\sum F_x = 0; R_{AB} \cos 6.84^\circ - P = 0 \Rightarrow P = R_{AB} \cos 6.84^\circ \quad (1)$$

$$\sum F_y = 0; T - 60 - R_{AB} \sin 6.84^\circ = 0$$

$$T = 60 + R_{AB} \sin 6.84^\circ \quad (2)$$

$$\mu = 0.12$$

$$\phi = \tan^{-1} 0.12 \\ = 6.84^\circ$$



$$\sum F_y = 0; T - 120 + R_A \sin 6.84^\circ + R_B \sin 6.84^\circ = 0$$

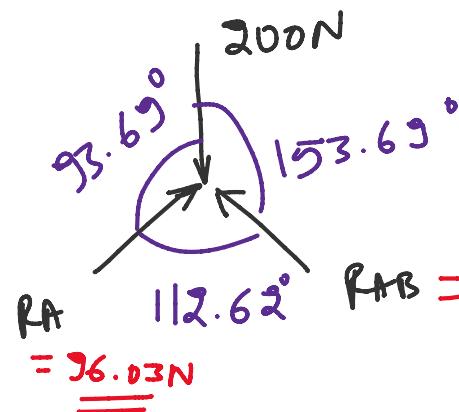
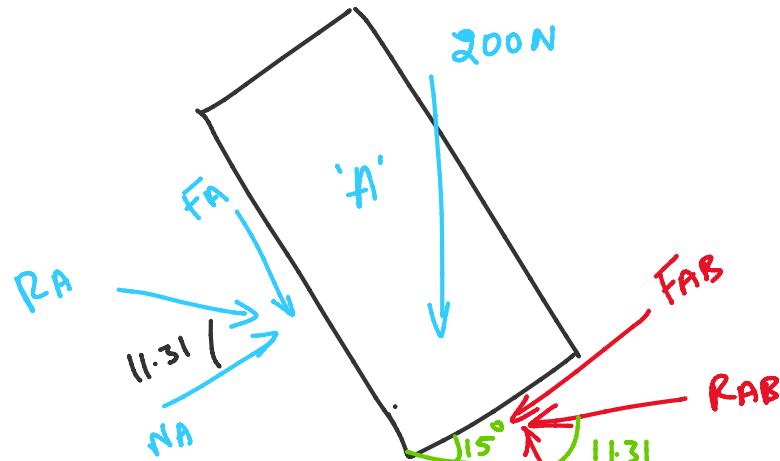
$$60 + R_B \sin 6.84^\circ - 120 + R_A \sin 6.84^\circ + R_B \sin 6.84^\circ = 0$$

$$R_{AB} = 167.93 N$$

$$P = 167.93 \text{ cos } 6.84$$

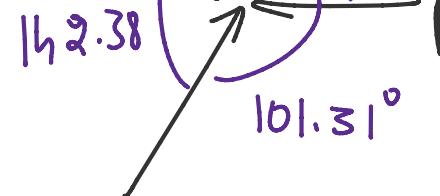
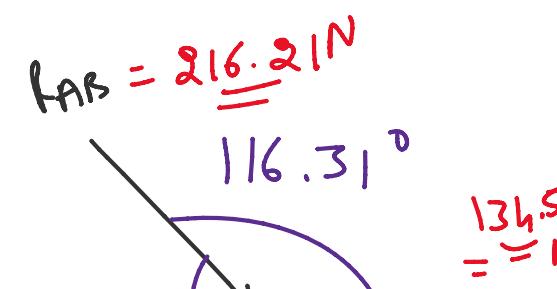
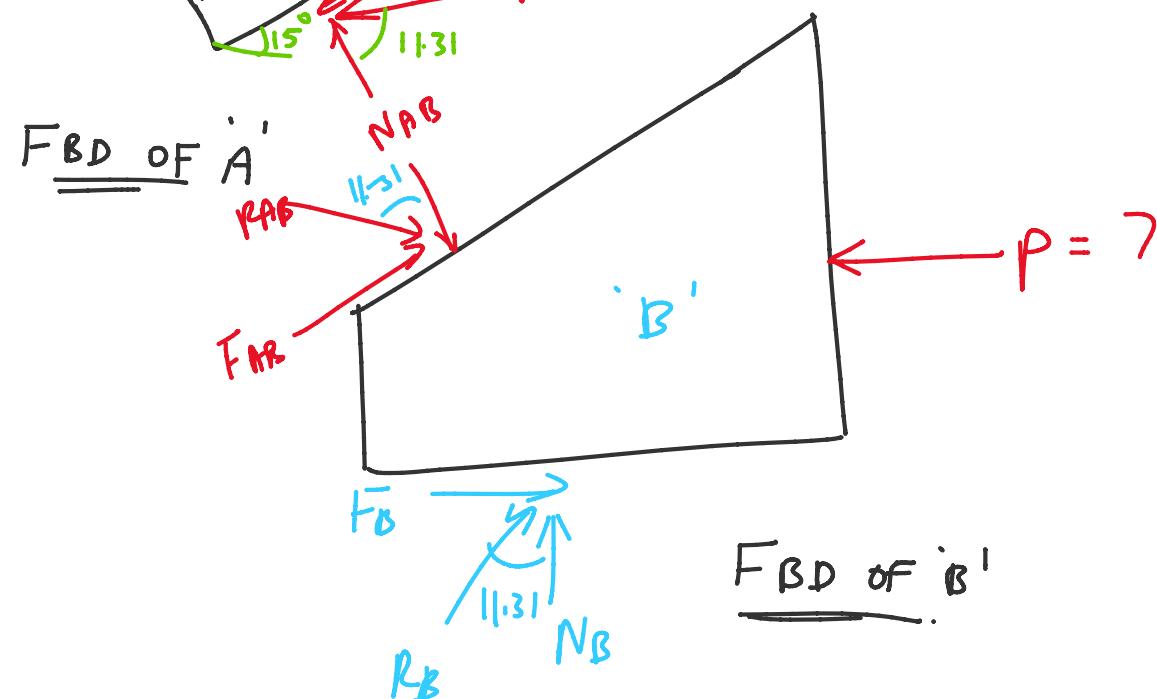
$$P = 166.73 N$$

T8)



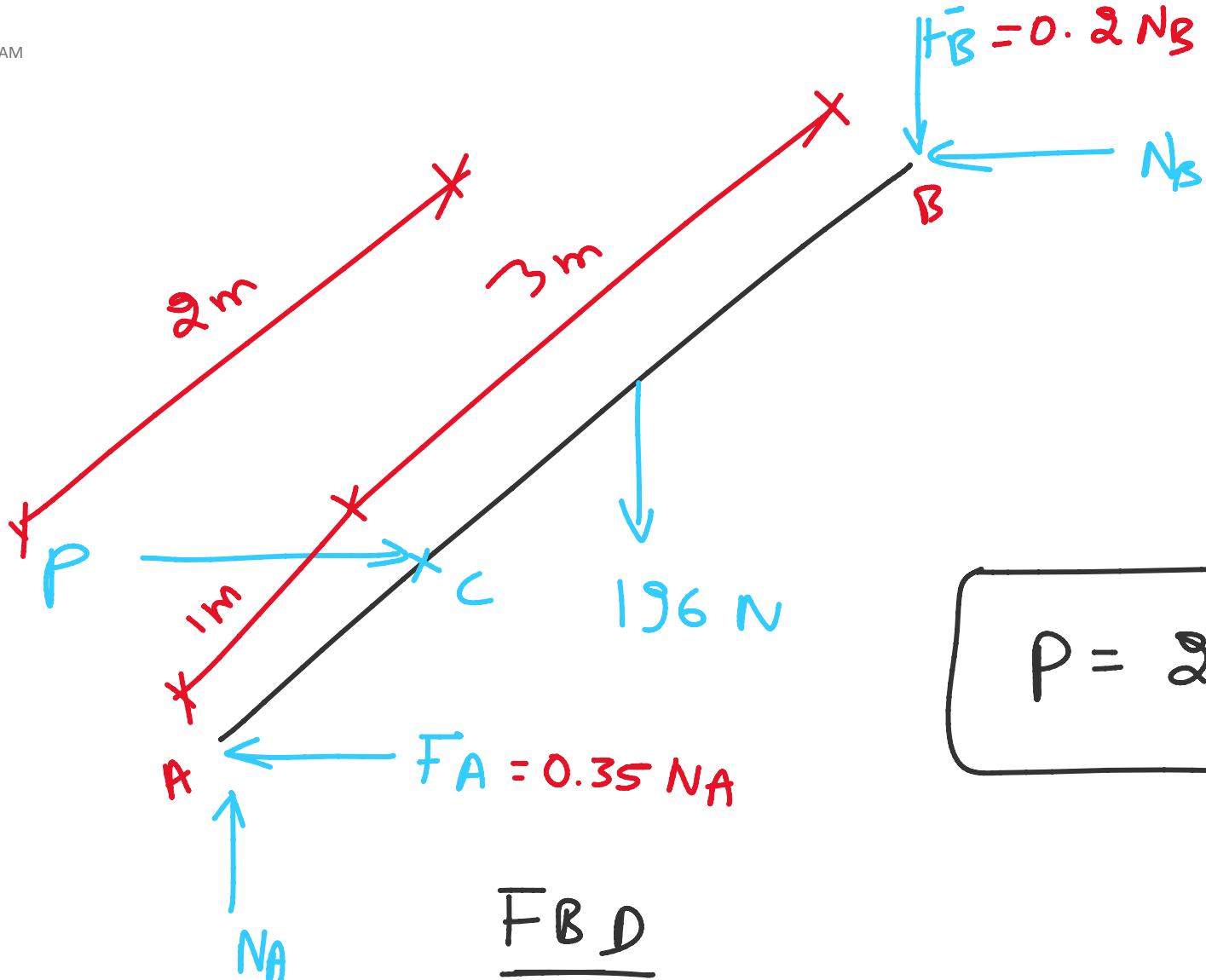
$$\mu = 0.2$$

$$\phi = \underline{\underline{11.31}}^\circ$$



$$R_B = \underline{\underline{197.65N}}$$

T9)



$$P = 256.74 \text{ N}$$