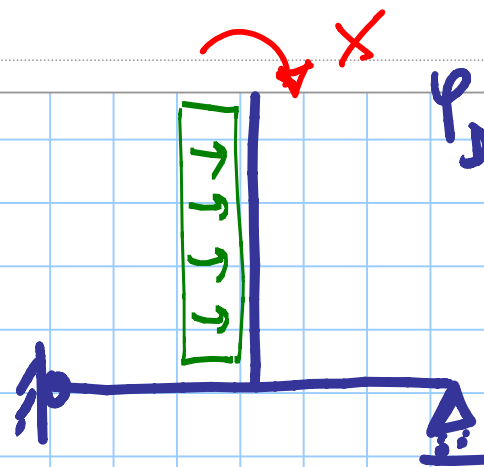
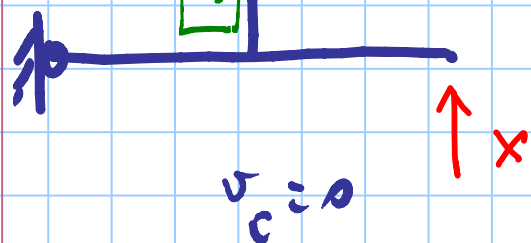
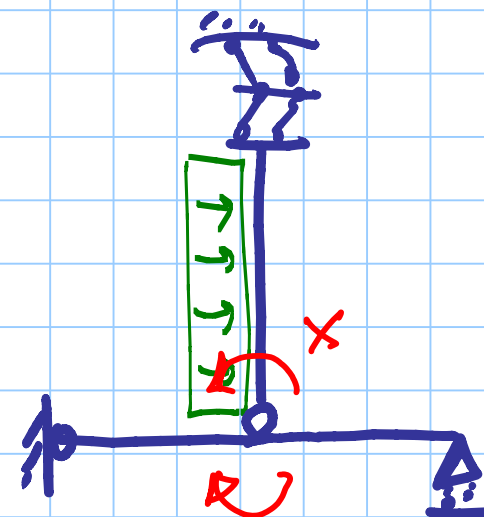


③

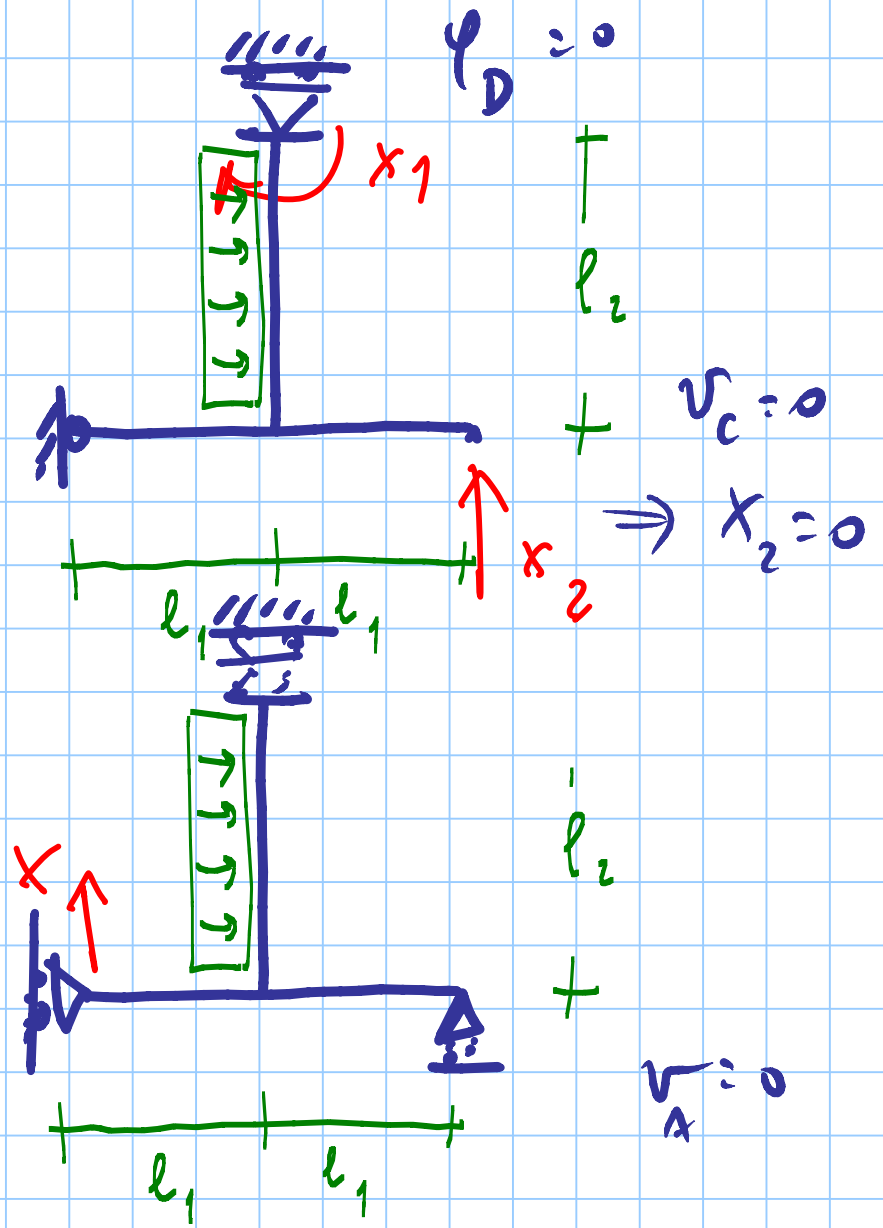
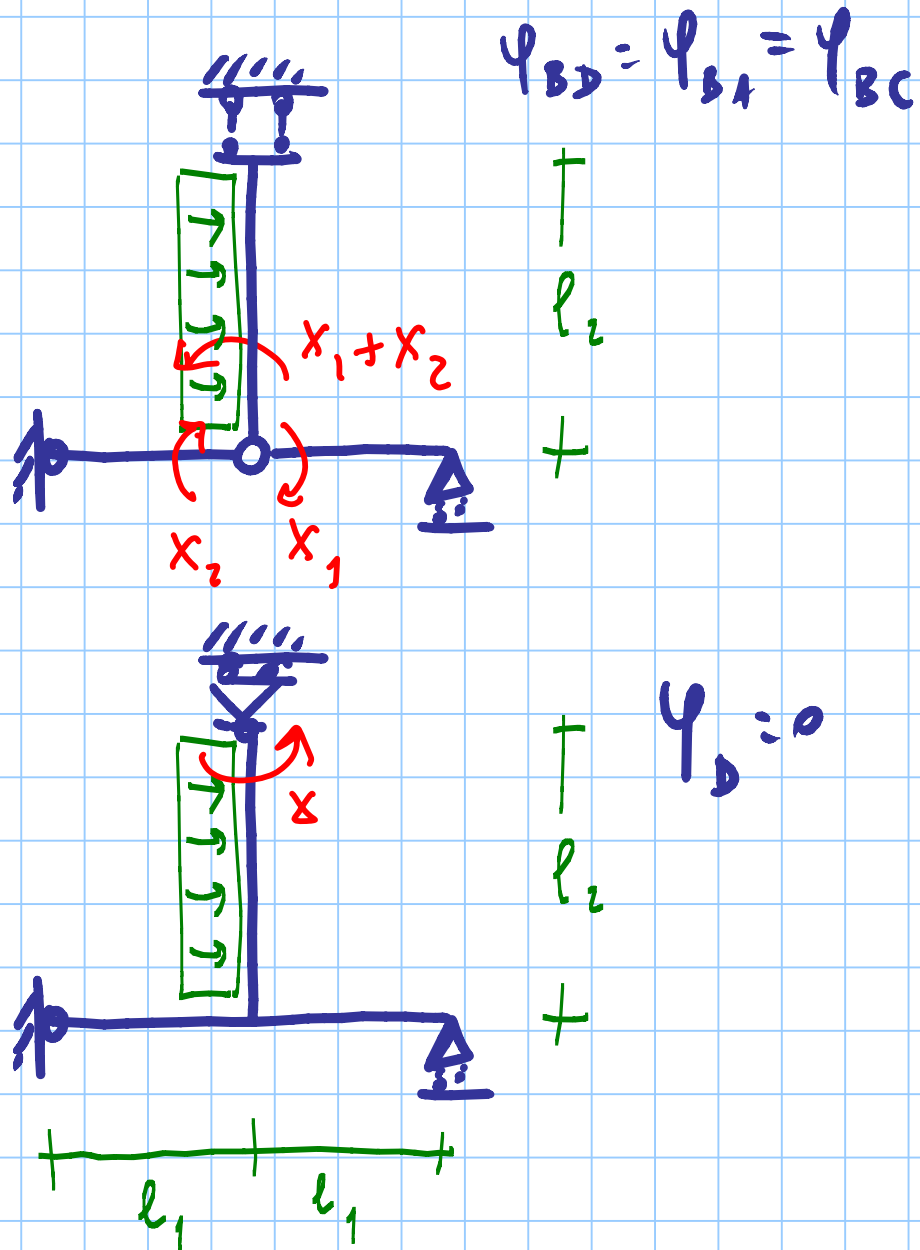


$\varphi_D = 0$ ①

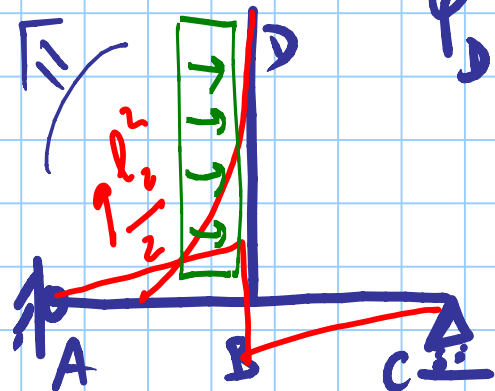


②

$\varphi_{BD} = \varphi_{BA}$

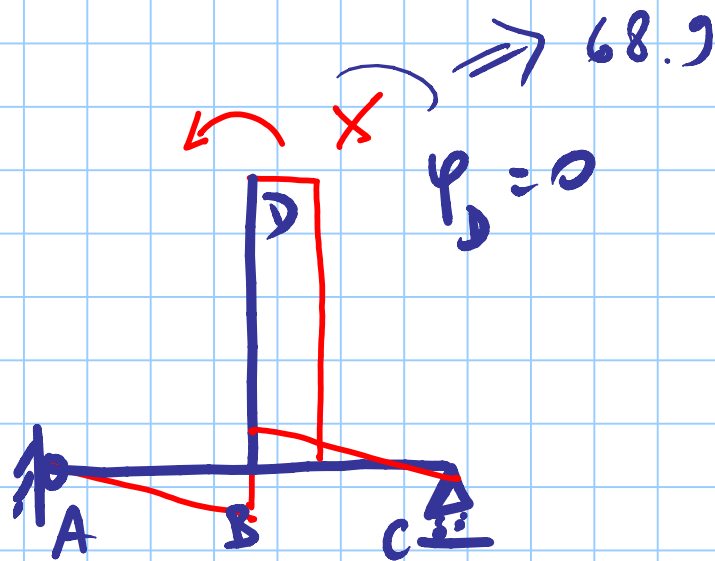


153.6

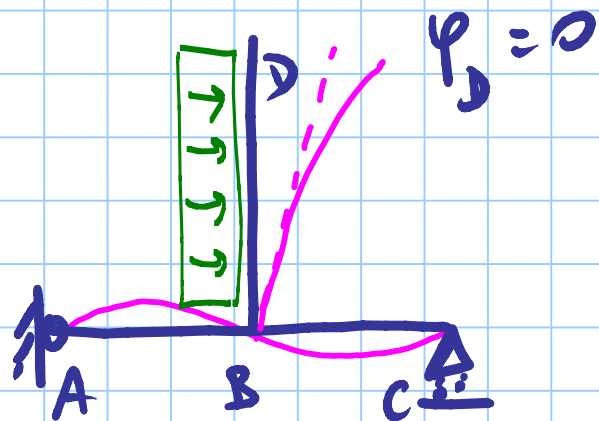


$$\varphi_D = 0$$

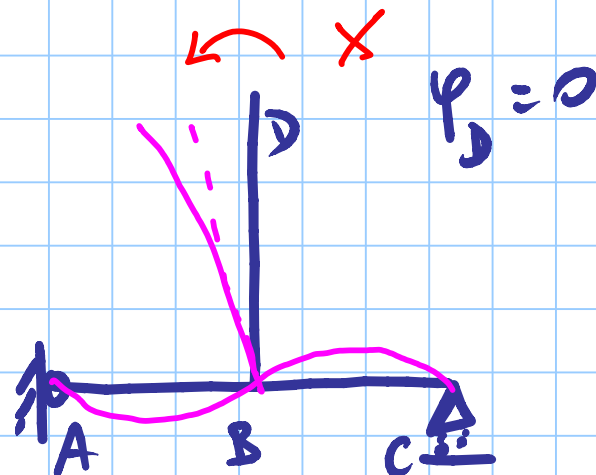
①



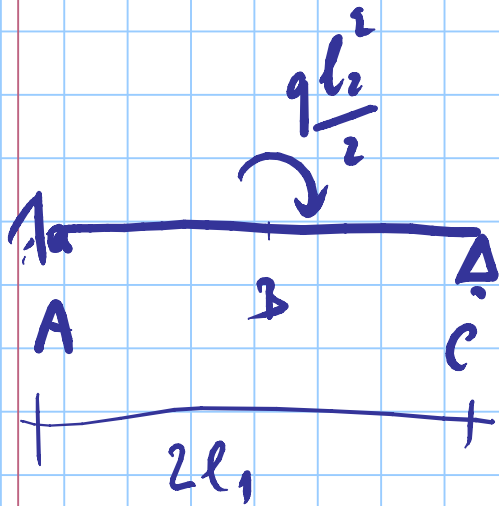
$$\varphi_D = 0$$



$$\varphi_D = 0$$



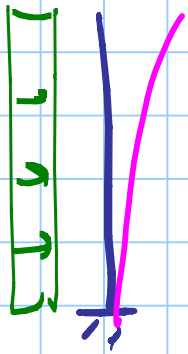
$$\varphi_D = 0$$



$$\varphi_B = \left[\frac{M l}{12 EI} \right] = \frac{\frac{q l_2^2}{2} 2 l_1}{12 EI}$$

$$= \frac{q l_2^2 l_1}{12 EI}$$

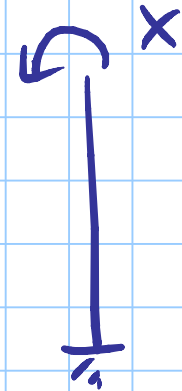
$$\varphi_B = \frac{x 2 l_1}{12 EI}$$



$$\varphi_D = \frac{q l_2^3}{6 E I}$$

Tot

$$\varphi_D = - \frac{q l_2^2 l_1}{12 E I} - \frac{q l_2^3}{6 E I}$$



$$\varphi_D = \frac{X l_2}{E I}$$

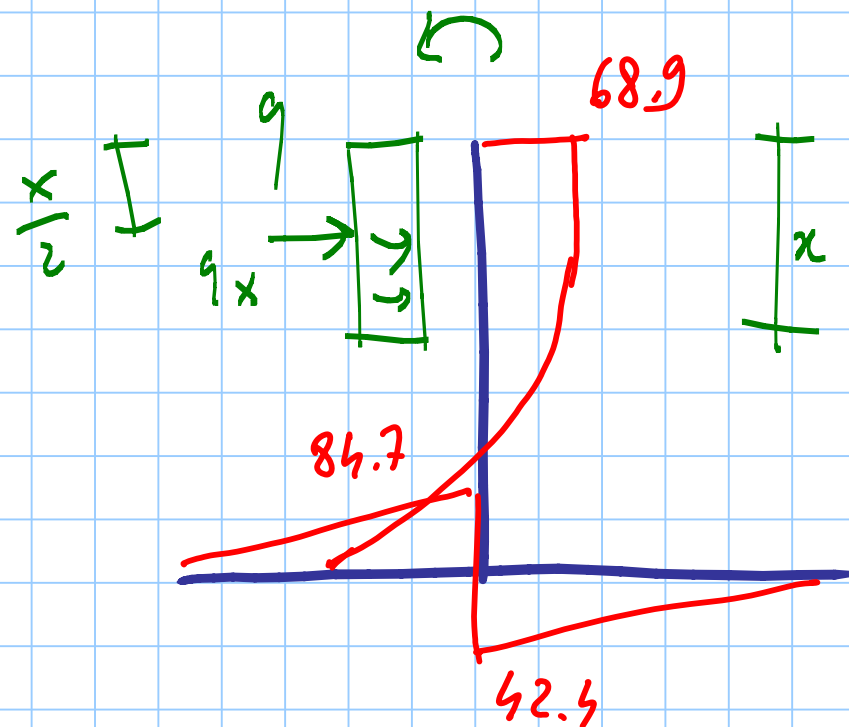
Tot

$$\varphi_D = \frac{X l_1}{6 E I} + \frac{X l_2}{E I}$$

$$-\frac{9l_2^2 l_1}{12EI} - \frac{9l_2^3}{6EI} + \frac{Xl_1}{6EI} + \frac{Xl_2}{EI} = 0$$

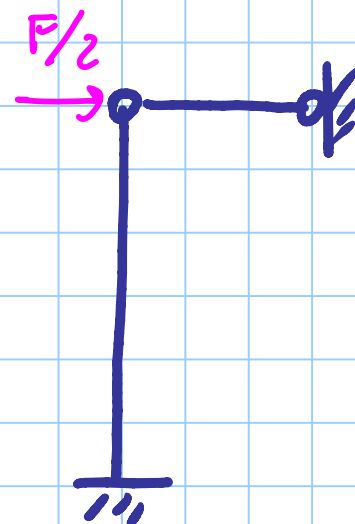
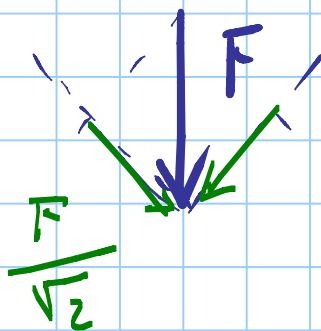
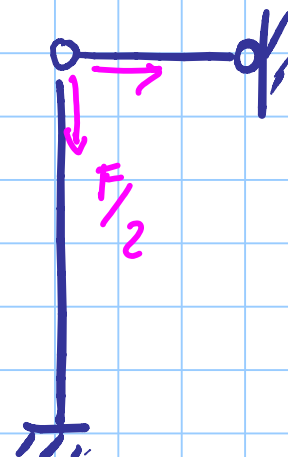
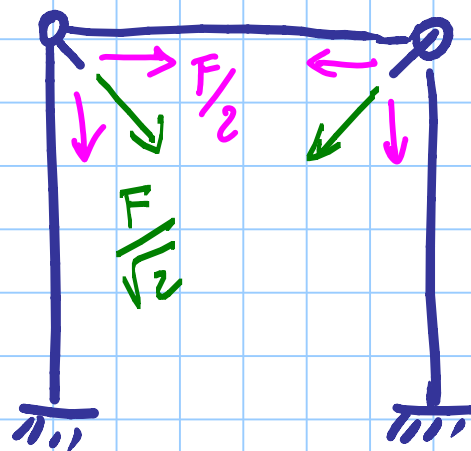
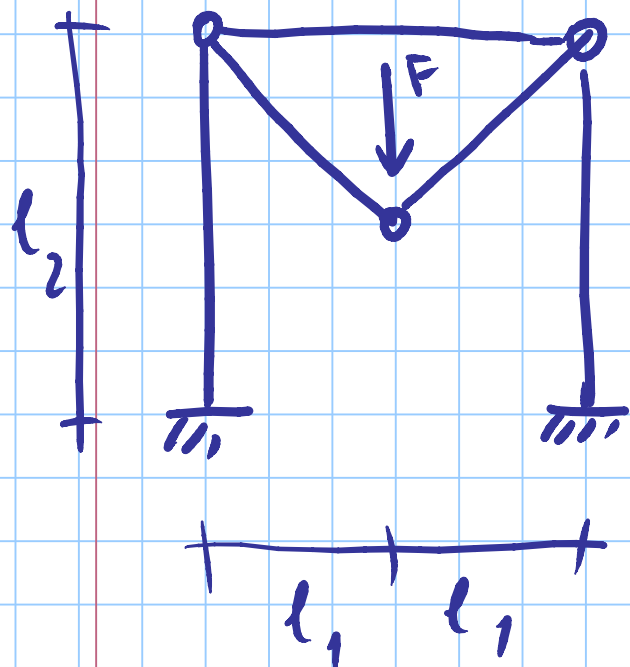
$$-\frac{9l_2^2}{12} (l_1 + 2l_2) + \frac{X}{6} (l_1 + 6l_2) = 0$$

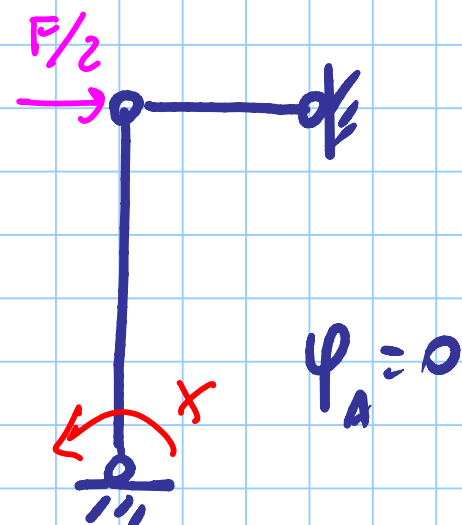
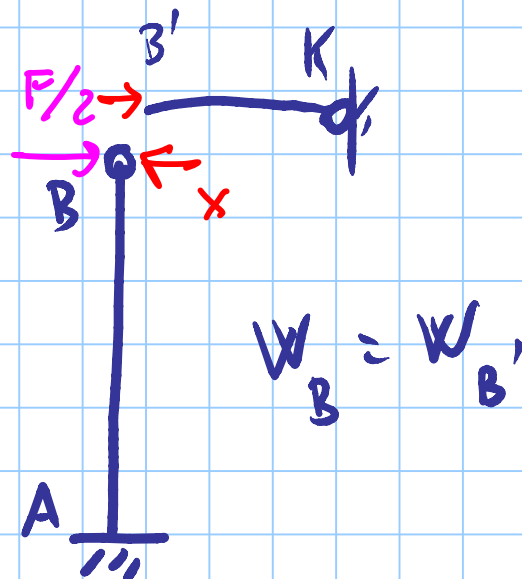
$$X = \underbrace{\frac{9l_2^2}{2}}_{153.6} \underbrace{\frac{l_1 + 2l_2}{l_1 + 6l_2}}_{0.448} = 68.9 \text{ kNm}$$



$$M - \frac{q x^2}{2} = 0$$

$$x = \sqrt{\frac{2M}{q}} = 2.14 \text{ m}$$





$$w_B = \left(\frac{F}{2} - x \right) \frac{l_2^3}{3EI}$$

$$w_{B'} = \frac{x l_1}{EA}$$

$$\left(\frac{F}{2} - x\right) \frac{l_2^3}{3EI} = \frac{x l_1}{EA}$$

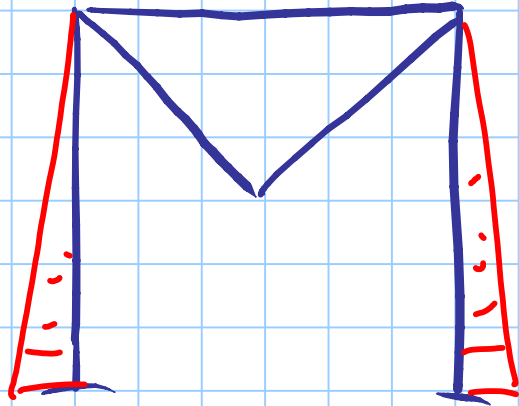
$$\left(\frac{F}{2} - x\right) = x \frac{3l_1 I}{l_2^3 A}$$

$$\frac{F}{2} = x \left(1 + \frac{3l_1 I}{l_2^3 A}\right) \Rightarrow x = \frac{F}{2} \frac{1}{1 + \frac{3l_1 I}{l_2^3 A}} =$$

$$\frac{3l_1 I}{l_2^3 A} = \frac{3 \times 250 \times 43190}{320^3 \times 9.6} = 0.103 \quad = 90.7 \text{ kN}$$

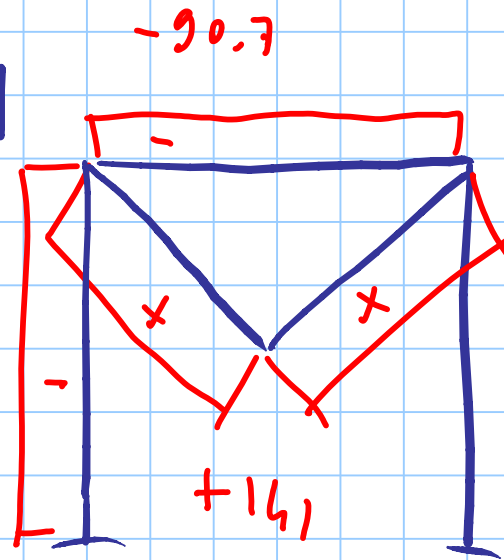
$$F - x = 9.3 \text{ kN}$$

M

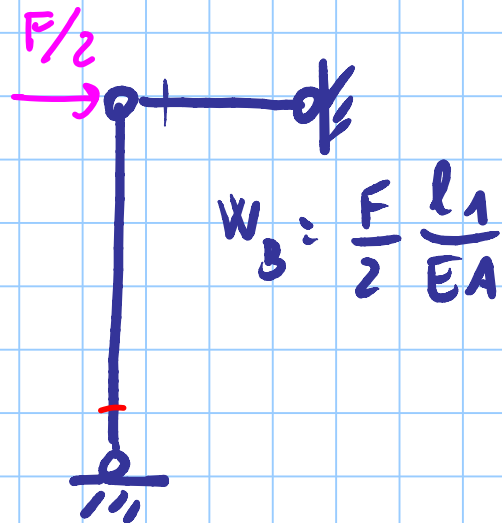


$$M = 9.3 \times 3.20 = 29.8 \text{ kNm}$$

N

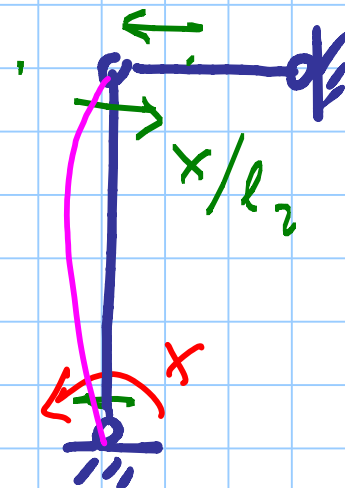


-100 kN



$$W_B = \frac{F}{2} \frac{l_1}{EA}$$

$$\varphi_A = - \frac{F}{2} \frac{l_1}{EA} \frac{1}{l_2}$$



$$\varphi_A = \frac{x l_2}{3 E I_1} + \frac{x l_1}{E A l_2^2}$$