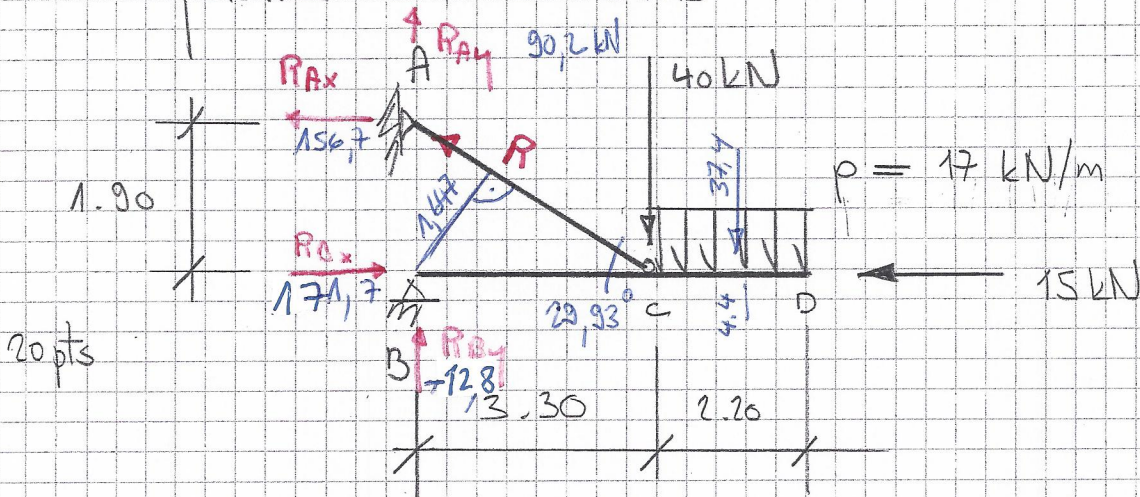


ETC 1

6.06.23

Nom :

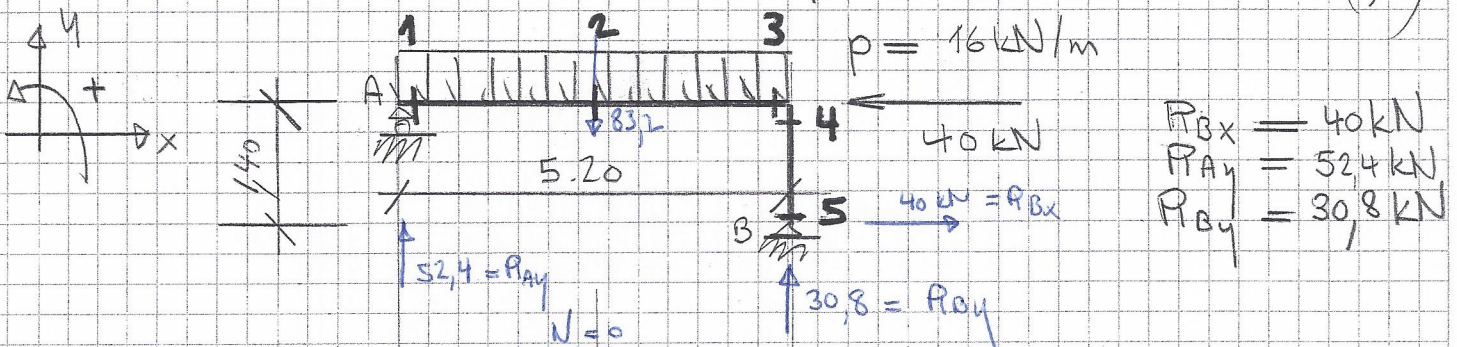
1. Déterminez les réactions d'appuis du système ci-dessous



20 pts

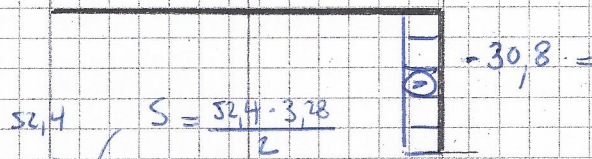
2. Déterminez les efforts intérieurs de la poutre ci-dessous. Déterminez la position + valeur M_{max} (+/-)

30 pts

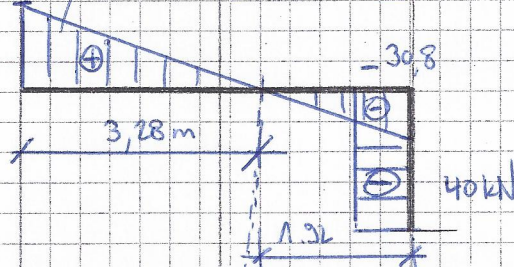


$$\begin{aligned} R_{Bx} &= 40 \text{ kN} \\ R_{Ay} &= 52.4 \text{ kN} \\ R_{By} &= 30.8 \text{ kN} \end{aligned}$$

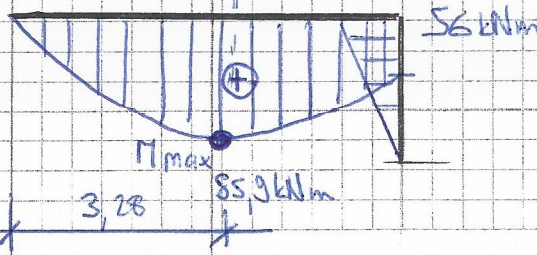
N (pts)



V (pts)



M (10 pts)



Compos (10 pts)

$$\overset{+}{\rightarrow} \Sigma F_x = 0$$

$$-15 + R_{Bx} - R_{Ax} = 0$$

$$R_{Bx} - R_{Ax} = 15 \text{ kN}$$

$$\overset{+}{\uparrow} \Sigma F_y = 0$$

$$R_{By} + R_{Ay} - 40 - (17 \cdot 2,2) = 0$$

$$R_{By} + R_{Ay} = 40 + 37,4 = 77,4 \text{ kN}$$

$$\overset{+}{\curvearrowright} \Sigma M_B = 0$$

$$R \cdot 1,64 - (40 \cdot 3,3) - (17 \cdot 2,2 \cdot 4,4) = 0$$

$$R = \frac{132 + 164,56}{1,64} = \frac{296,56}{1,64} = 180,83 \text{ kN}$$

$$R_{Ax} = R \cos \alpha = 180,84 \cdot \cos 29,93^\circ = 156,7 \text{ kN} \bullet$$

$$R_{Ay} = R \sin \alpha = 180,84 \cdot \sin 29,93^\circ = 90,2 \text{ kN} \bullet$$

$$R_{Bx} = 15 + 156,7 = 171,7 \text{ kN} \bullet$$

$$R_{By} = 77,4 - 90,2 = -12,8 \text{ kN} \bullet$$

Controle : $\overset{+}{\curvearrowright} \Sigma M_B = 0 \quad (156,7 \cdot 1,9) - (40 \cdot 3,3) - (17 \cdot 2,2 \cdot 4,4)$
 $= 1, \dots \text{ kN}$