

ETC 3

Nom :

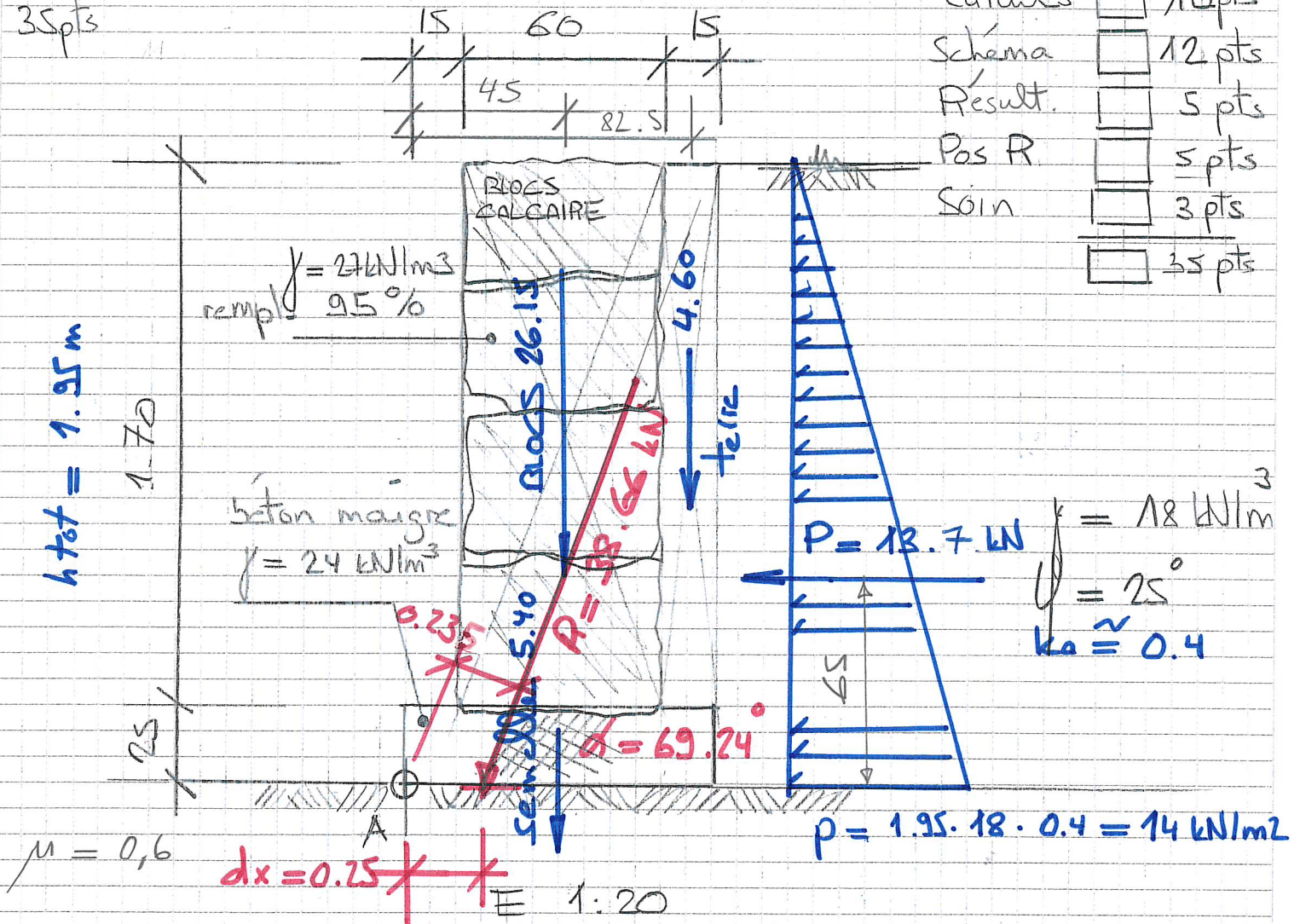
22.01.24

1

Durée 60'

1. Déterminez l'équilibre global de la structure ci-dessous; renversement et glissement. Déterminez la position de la résultante par rapport au point A. Faire schéma à l'échelle

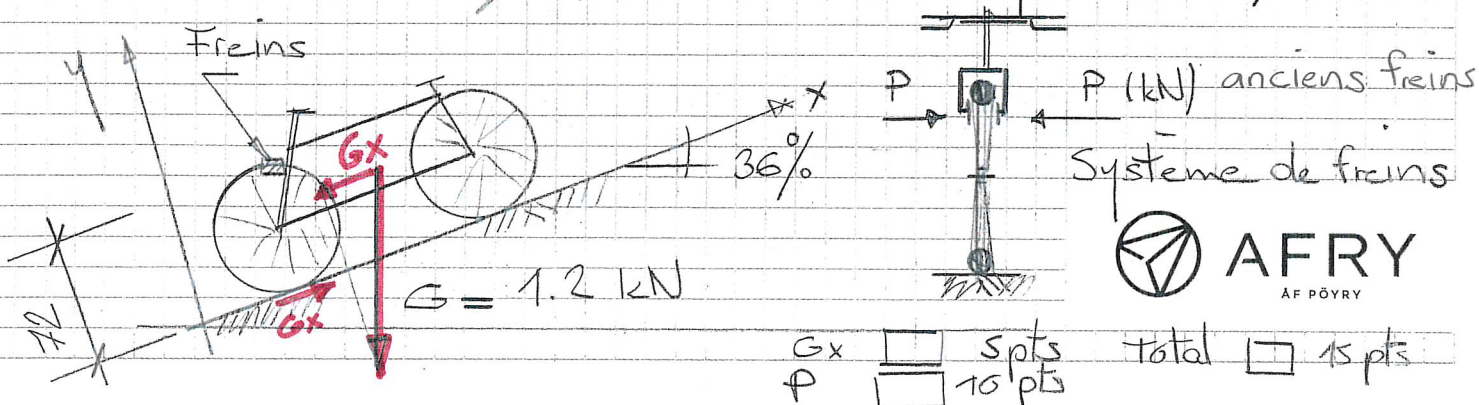
35pts



Calculs	<input type="checkbox"/>	10pts
Schéma	<input type="checkbox"/>	12 pts
Résult.	<input type="checkbox"/>	5 pts
Pos R	<input type="checkbox"/>	5 pts
Soin	<input type="checkbox"/>	3 pts
	<input type="checkbox"/>	35 pts

2. Quelle doit être la pression de la pince des freins du système pour bloquer le mouvement ? On admettra $\mu_{\text{frein}} = 0.65$ pente 36%

15pts



Gx	<input type="checkbox"/>	5pts
P	<input type="checkbox"/>	10 pts
TOTAL	<input type="checkbox"/>	15 pts

$$\Sigma F_{renv} = \frac{0.4 \cdot 1.95 \cdot 18}{14.04} - 1.95 \cdot 0.5 \approx 13.70$$

$$\Sigma F_{stab} \Rightarrow \begin{array}{l} \text{blocs} \quad 0.6 \cdot 1.70 \cdot 95\% \cdot 27 = 26.15 \\ \text{terre} \quad 0.15 \cdot 1.70 \cdot 18 = 4.60 \\ \text{semelle} \quad 0.25 \cdot 0.90 \cdot 24 = 5.40 \\ \hline \approx 36.15 \end{array}$$

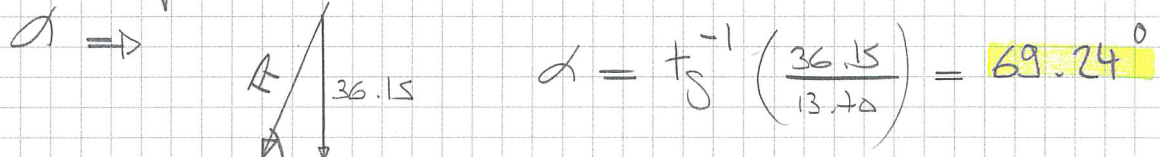
$$FS_{glissement} = \frac{36.15 \cdot 0.6}{13.70} = \frac{21.7}{13.7} = 1.58$$

$$\Sigma M_{renv} = 13.7 \cdot 0.65 = 8.90 \text{ kNm}$$

$$\Sigma M_{stab} = \begin{array}{l} (5.4 + 26.15) \cdot 0.45 = 14.20 \\ 4.60 \cdot 0.825 = 3.80 \\ \hline 18 \text{ kNm} \end{array}$$

$$FS_{renv} = \frac{18}{8.9} = 2.02$$

$$R = \sqrt{36.15^2 + 13.7^2} = 38.66 \text{ kN}$$

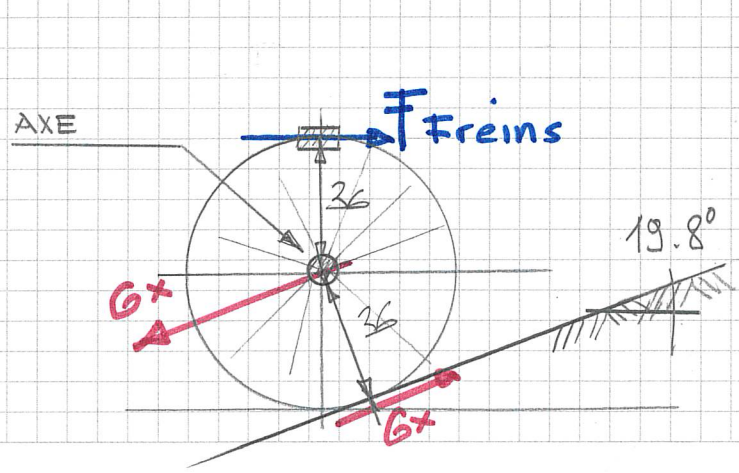


$$d = \text{pos } R \Rightarrow \frac{M_{tot}}{R} = \frac{(18 - 8.9)}{38.66} = 0.235 \text{ m}$$

$$dx = \frac{(18 - 8.9)}{36.15} = 0.252 \text{ m}$$

2 - 36% \Rightarrow $\tan^{-1} \left(\frac{36}{100} \right) = 19.8^\circ$

$$G_x = 1.20 \cdot \sin 19.8 = 0.41 \text{ kN}$$



$$F_{frein} \cdot d = G_x \cdot d$$

$$2 \cdot P \cdot \mu = G_x$$

$$P = \frac{G_x}{2 \cdot \mu} = \frac{0.41}{2 \cdot 0.65} = 0.315 \text{ kN}$$