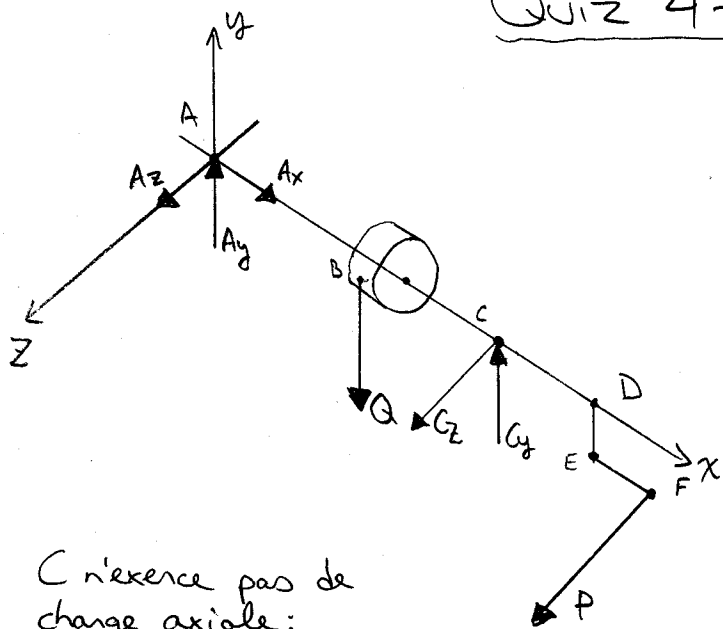


QUIZ 4 - SOLUTIONS



C n'exerce pas de charge axiale:
 $C_x = 0$

$$\vec{AB} = 40\vec{i} + 10\vec{k}$$

$$\vec{AC} = 80\vec{i}$$

$$\vec{AF} = 120\vec{i} - 20\vec{j}$$

$$\vec{Q} = -500\vec{j}$$

$$\vec{P} = P\vec{k}$$

$$\vec{A} = A_x\vec{i} + A_y\vec{j} + A_z\vec{k}$$

$$\vec{C} = 0\vec{i} + C_y\vec{j} + C_z\vec{k}$$

Conditions d'équilibre:

$$\sum M_A = 0 = \vec{AB} \times \vec{Q} + \vec{AC} \times \vec{C} + \vec{AF} \times \vec{P}$$

$$= \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 40 & 0 & 10 \\ 0 & -500 & 0 \end{vmatrix} + \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 80 & 0 & 0 \\ 0 & C_y & C_z \end{vmatrix} + \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 120 & -20 & 0 \\ 0 & 0 & P \end{vmatrix} = 0$$

$$= 5000\vec{i} - 20000\vec{k} - 80C_z\vec{j} + 80C_y\vec{k} - 20P\vec{i} - 120P\vec{j} = 0$$

$$\vec{i} \Rightarrow 5000 - 20P = 0$$

$$\boxed{P = 250 \text{ N}}$$

$$\vec{j} \Rightarrow -80C_z - 120P = 0$$

$$\boxed{C_z = -375 \text{ N}}$$

$$\vec{k} \Rightarrow -20000 + 80C_y = 0$$

$$\boxed{C_y = 250 \text{ N}}$$

$$\sum F_x = 0$$

$$\boxed{A_x = 0}$$

$$\sum F_y = 0$$

$$A_y - Q + C_y = 0$$

$$\boxed{A_y = 250 \text{ N}}$$

$$\sum F_z = 0$$

$$A_z + C_z + P = 0$$

$$\boxed{A_z = 125 \text{ N}}$$