$$\overrightarrow{BA}\wedge\overrightarrow{R_A}+\overrightarrow{BC}\wedge\overrightarrow{R_c}+\overrightarrow{BG}\wedge\overrightarrow{mg}+\overrightarrow{BG}\wedge\overrightarrow{F_V}=\overrightarrow{0}$$

$$\begin{vmatrix}0\\0\\-a\end{vmatrix}\wedge\begin{vmatrix}X_A\\Y_A\\Z_A\end{vmatrix}+\begin{vmatrix}0\\-c\\b\end{vmatrix}\wedge\begin{vmatrix}-F_3\\0\\0\end{vmatrix}+\begin{vmatrix}f\\e\\d\end{vmatrix}\wedge\begin{vmatrix}0\\0\\-mg\end{vmatrix}+\begin{vmatrix}f\\e\\d\end{vmatrix}\wedge\begin{vmatrix}-F_V\\0\\0\end{vmatrix}=\begin{vmatrix}0\\0\\0\end{vmatrix}$$

$$\begin{cases} a.Y_A - e.mg = 0 \\ -a.X_A - b.F_3 + f.mg - d.F_V = 0 \\ -c.F_3 + e.F_V = 0 \end{cases}$$

$$\boxed{Y_A = \frac{e}{a}mg} \quad (1)$$

$$\boxed{X_A = \frac{1}{a}(bF_3 - fmg + d.F_V)} \quad (2)$$

$$* \boxed{F_3 = \frac{e}{c}F_V} \quad (3)$$

2/ Application numérique :

$$F_3 = \frac{2}{4}.1500 \Rightarrow \boxed{F_3 = 750\,daN}$$

3/ On isole le système { cuvelet + bateau }

B.A.M.E : (voir question 1) (1) (4)

TRS : $\overrightarrow{R}(\overline{104}\to 104) = \overrightarrow{0}$

$$\begin{cases} X_A + X_B - F_3 - F_V = 0 & (4) \\ Y_A + Y_B = 0 & (5) \\ Z_A - mg = 0 & (6) \end{cases}$$

(4) $\Rightarrow X_B = -X_A + F_3 + F_V$

$$\boxed{X_B = \left(1-\frac{b}{a}\right)F_3 + \frac{f}{a}mg + \left(1-\frac{d}{a}\right)F_V}$$

(5) (1) $\Rightarrow \boxed{Y_B = -\frac{e}{a}mg}$

(6) $\Rightarrow \boxed{Z_A = mg}$

4) A.N :

$X_A = -4736\,daN$ $\quad X_B = 7036\,daN$

$Y_A = 1962\,daN$ $\quad Y_B = -1962\,daN$

$Z_A = 3924\,daN$

(IDY)