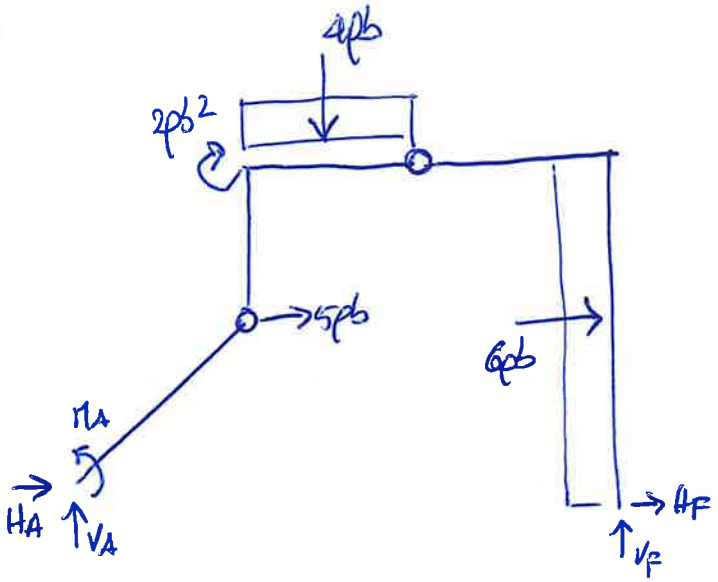
Es1



$\rightarrow R_x = 0 \quad H_A + H_F + 5pb + 6pb = 0$

$\uparrow R_y = 0 \quad V_A + V_F - 4pb = 0$

$\circlearrowleft M_{t(A)} = 0 \quad M_A + V_F 3b + 5pb^2 - 2pb^2 - \frac{2}{3}\frac{6}{2}pb^2 + - 6pb^2 = 0$

$M_{t(B)}^{2+3} = 0 \quad V_F 2b + H_F b - 2pb^2 - 4\frac{1}{2}pb = 0$

$M_{t(C)}^{3} = 0 \quad V_F b + H_F 2b + 6pb^2 = 0$

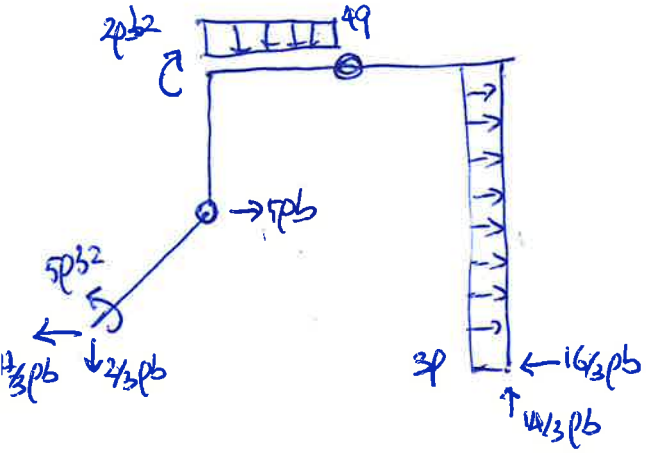
I) $H_A + H_F = -11pb \rightarrow H_A = -11pb - H_F = -11pb - \left(-\frac{16}{3}pb\right) = \left(-11 + \frac{16}{3}\right)pb = \left(-\frac{33+16}{3}\right)pb = -\frac{17}{3}pb$ ③

II) $V_A + V_F = 4pb \rightarrow V_A = 4pb - V_F = 4pb - \frac{14}{3}pb = \left(\frac{12-14}{3}\right)pb = -\frac{2}{3}pb$ ④

III) $M_A + V_F 3b = 19pb^2 \rightarrow M_A = 19pb^2 - V_F 3b = 19pb^2 - \frac{14}{3}pb \cdot 3b = 5pb^2$ ⑤

IV) $V_F 2b + H_F b = 4pb^2$ ‖ $V_F = (4pb - H_F)/2 = 2pb - H_F/2$ $\quad V_F = 2pb - \left(-\frac{16}{3}pb\right)\frac{1}{2} = \frac{12+16}{6}pb = \frac{28}{6}pb = \frac{14}{3}pb$ ②

V) $V_F b + H_F 2b = -6pb^2$ ‖ $2pb - \frac{1}{2}H_F + 2H_F = -6pb$ $\quad \frac{3}{2}H_F = -8pb$ $\quad H_F = -\frac{16}{3}pb$ ①



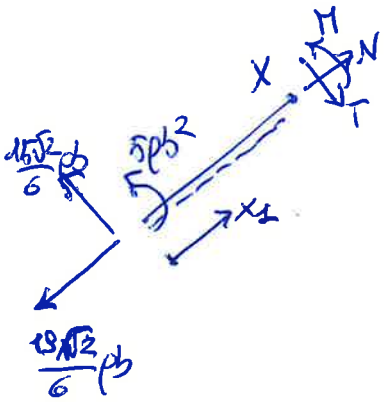
$\circlearrowleft M_{t(F)} = 0 \quad -6pb^2 + \frac{2}{4}\frac{6}{3}pb^2 - 2pb^2 - 5pb^2 + 5pb^2 + + 2\frac{1}{3}pb \cdot 3b = 0$

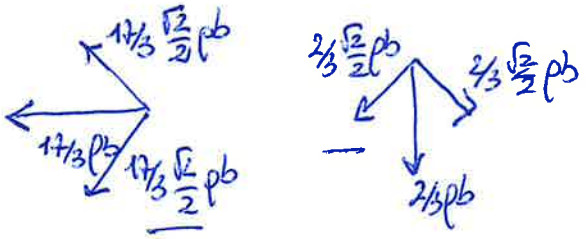
$\circlearrowleft M_{t(B)}^{①} = 0 \quad \underbrace{\frac{2}{3}pb^2 + 5pb^2}_{17/3pb^2} - \frac{17}{3}pb^2 = 0$

$\circlearrowleft M_{t(D)}^{(1+2)} = 0 \quad \frac{2}{4}\frac{6}{3}pb^2 - 2pb^2 + 5pb^2 + 5pb^2 + \frac{4}{3}pb^2 - \frac{34}{3}pb \cdot 2b = 0$ $\quad \underbrace{\qquad\qquad}_{34/3pb^2}$

A → B

$0 < x_1 < b\sqrt{2}$





$\frac{18\sqrt{2}}{6}\rho b$ ↙ $\left(\frac{17}{3}\frac{\sqrt{2}}{2}+\frac{2}{3}\frac{\sqrt{2}}{2}\right)\rho b = \left(\frac{17\sqrt{2}}{6}+\frac{2\sqrt{2}}{6}\right)\rho b = \frac{18\sqrt{2}}{6}\rho b$

$\frac{15\sqrt{2}}{6}\rho b$ ↖ $\left(\frac{17}{3}\frac{\sqrt{2}}{2}-\frac{2}{3}\frac{\sqrt{2}}{2}\right)\rho b = \left(\frac{17\sqrt{2}}{6}-\frac{2\sqrt{2}}{6}\right)\rho b = \frac{15\sqrt{2}}{6}\rho b$

$\uparrow R_{1t} = 0 \quad N(x_1) - \frac{18\sqrt{2}}{6}\rho b = 0 \quad N(x_1) = \frac{18\sqrt{2}}{6}\rho b \quad (+)$

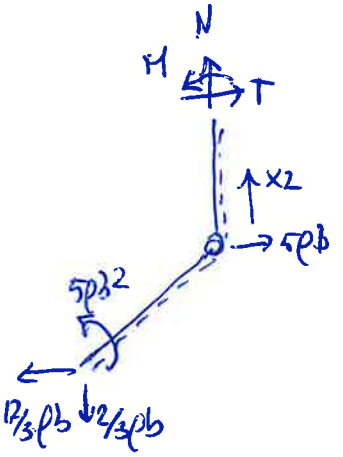
$\searrow R_{1} = 0 \quad T(x_1) - \frac{15\sqrt{2}}{6}\rho b = 0 \quad T(x_1) = \frac{15\sqrt{2}}{6}\rho b \quad (+) \quad T(x_1) = \frac{5\sqrt{2}}{2}\rho b$

$\sum M(x) = 0 \quad M(x_1) + 5\rho b^2 - \frac{15\sqrt{2}}{6}\rho b = 0 \quad M(x_1) = -5\rho b^2 + \frac{5\sqrt{2}}{2}\rho b x_1$

$x_1 = 0 \quad M = -5\rho b^2$

$x_1 = b\sqrt{2} \quad M = 0$

$0 < x_2 < b \qquad B \to C$



$\uparrow R_{1t} = 0 \quad N(x_2) - 2/3\rho b = 0 \quad N(x_2) = 2/3\rho b$

$\rightarrow R_1 = 0 \quad T(x_2) - 17/3\rho b + 5\rho b = 0 \quad T(x_2) = +17/3\rho b - 15/3\rho b = 2/3\rho b$

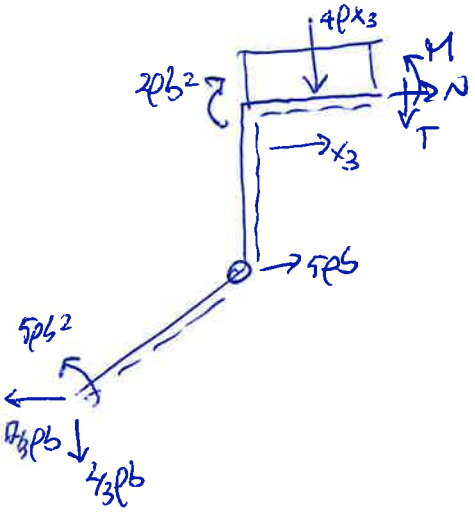
$\sum M(x) = 0 \quad M(x_2) + 5\rho b x_2 + 5\rho b^2 - 17/3\rho b(b + x_2) + 2/3\rho b^2 = 0$

$M(x_2) = \underbrace{-5\rho b^2 + 17/3\rho b^2 - 2/3\rho b^2}_{0} \underbrace{-5\rho b x_2 + 17/3\rho b x_2}_{2/3\rho b x_2} = 0$

$M(x_2) = 2/3\rho b x_2 \quad x_2 = 0 \quad \Pi = 0$

$x_2 = b \quad \Pi = 2/3\rho b^2$

C → D $0 < x_3 < b$



$\rightarrow R_H = 0 \quad N(x_3) - 2/3\rho b = 0 \quad N(x_3) = 2/3\rho b$

$\downarrow R_V = 0 \quad T(x_3) + 2/3\rho b + 4\rho x_3 = 0 \quad T(x_3) = -2/3\rho b - 4\rho x_3$

$T \begin{cases} x=0 & T = -2/3\rho b \\ x=b & T = -14/3\rho b \end{cases}$

$\circlearrowleft M(x_3) = 0 \quad M(x_3) + 4\rho x_3 \frac{x_3}{2} - 2\rho b^2 + 5\rho b^2 + 5\rho b^2 - 14/3\rho b 2b +$

$+ 2/3\rho b(b + x_4) = 0$

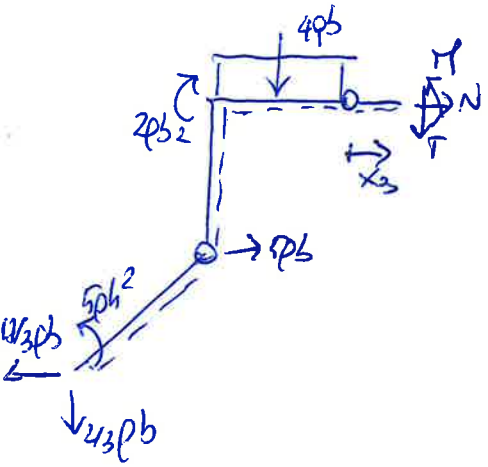
$M(x_3) + 2\rho x_3^2 + 2/3\rho b x_3 + \underbrace{(-2+5+5-34/3+2/3)}\rho b^2 = 0$

$\left(-\frac{6+15+15-34+2}{3}\right)\rho b^2 = 0$

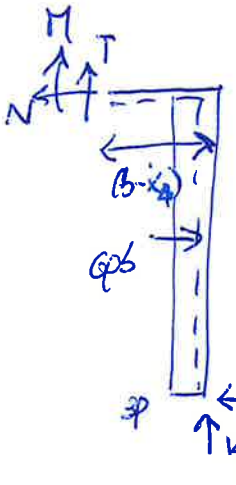
$M(x_3) + 2\rho x_3^2 + 2/3\rho b x_4 - 8/3\rho b^2 = 0$

$M(x_3) = 8/3\rho b^2 - 2\rho x_3^2 - 2/3\rho b x_3 \begin{cases} x=0 & M = 8/3\rho b^2 \\ x=b & M = 0 \end{cases}$

D → E $0 < x_4 < b$



E → D $(b - x_4)$



$\leftarrow R_H = 0 \quad N(x_4) + 16/3\rho b - 6\rho b = 0$

$N(x_4) = 2/3\rho b$

$\uparrow R_V = 0 \quad T(x_4) + 14/3\rho b = 0 \quad T(x_4) = -14/3\rho b$

$\circlearrowleft M_x = 0 \quad -M(x_4) + 6\rho b^2 - 16/3\rho b 2b +$

$+ 14/3\rho b(b - x_4) = 0$

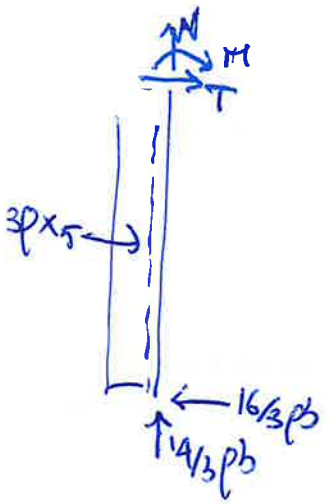
$-M(x_4) + 6\rho b^2 - 32/3\rho b^2 + 14/3\rho b^2 - 14/3\rho b x_4 = 0$

$M(x_4) = \left(\frac{18 - 32 + 14}{3}\right)\rho b^2 - 14/3\rho b x_4 = -14/3\rho b x_4$

$x=0 \rightarrow M=0$

$x=b \rightarrow M = -12/3\rho b^2$

$F \to E \qquad 0 < x_5 < 2b$



$\uparrow R_y = 0 \quad N(x_5) + 14/3\,pb = 0 \quad N(x_5) = -14/3\,pb$

$\rightarrow R_x = 0 \quad T(x_5) - 16/3\,pb + 3px_5 = 0$

$T(x_5) = 16/3\,pb - 3px_5$ — $x=0 \quad T = 16/3\,pb$; $x=2b \quad T = -2/3\,pb$

$\circlearrowleft M_{x=0} \quad -M(x_5) - 16/3\,pbx_5 + 3px_5\frac{x_5}{2} = 0$

$M(x_5) = -16/3\,pbx_5 + 3/2\,px_5^2$ — $x=0 \quad M=0$; $x=2b \quad M=$

$$-\frac{16}{3}pb2b + \frac{3}{2}p(2b)^2 =$$

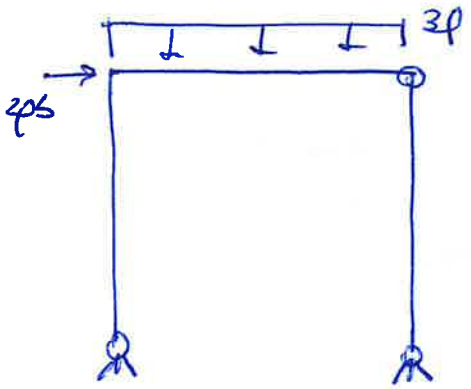
$$= -\frac{32}{3}pb^2 + \frac{3}{2}p4b^2 =$$

$$= -\frac{32}{3}pb^2 + 6pb^2 = \left(-\frac{32}{3} + \frac{18}{3}\right)pb^2 = -\frac{14}{3}pb^2$$

N.B. PER I DIAGRAMMI GUARDARE LA SOLUZIONE PUBBLICATA

COMPITO 8&C SdS- 20251014-P1 TESTO 2

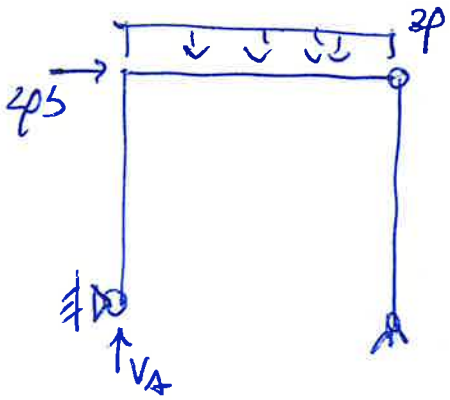
Ex 2

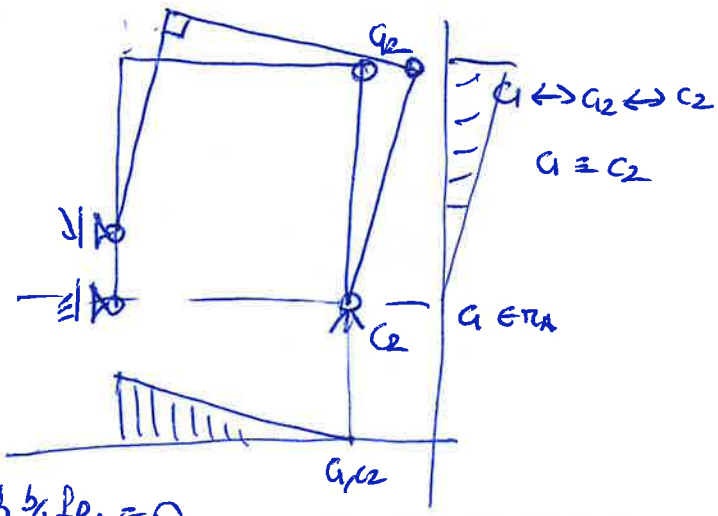


1) $V_A = ?$

2) $M_B = ?$

1) $V_A = ?$



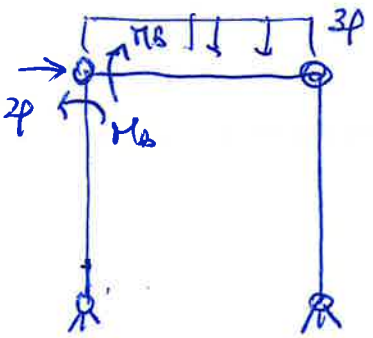


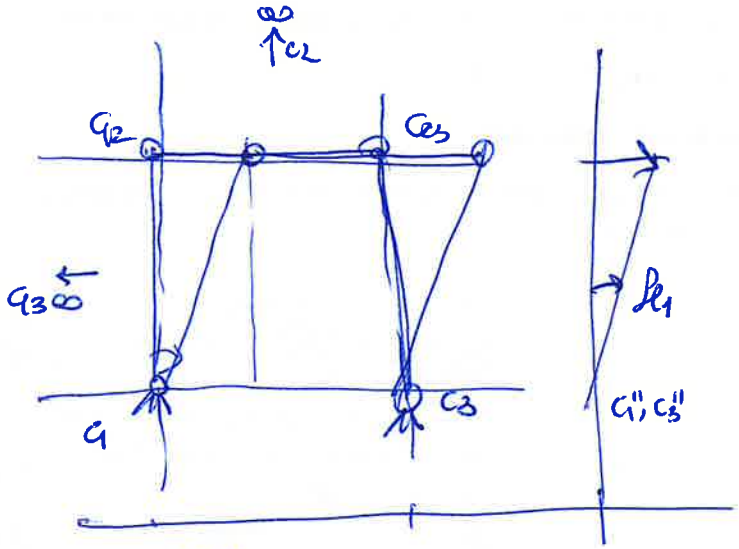
$\delta L_{EXT} = 0 \qquad V_A \cdot b\,\delta\varphi_1 + 2pb\,b\,\delta\varphi_1 - 3pb\,\tfrac{b}{2}\delta\varphi_1 = 0$

$V_A \cancel{b\delta\varphi_1} + 2pb^2\delta\varphi_1 - \tfrac{3}{2}pb^2\cancel{\delta\varphi_1} = 0 \qquad \forall\,\delta\varphi_1$

$V_A = -\tfrac{1}{2}pb$

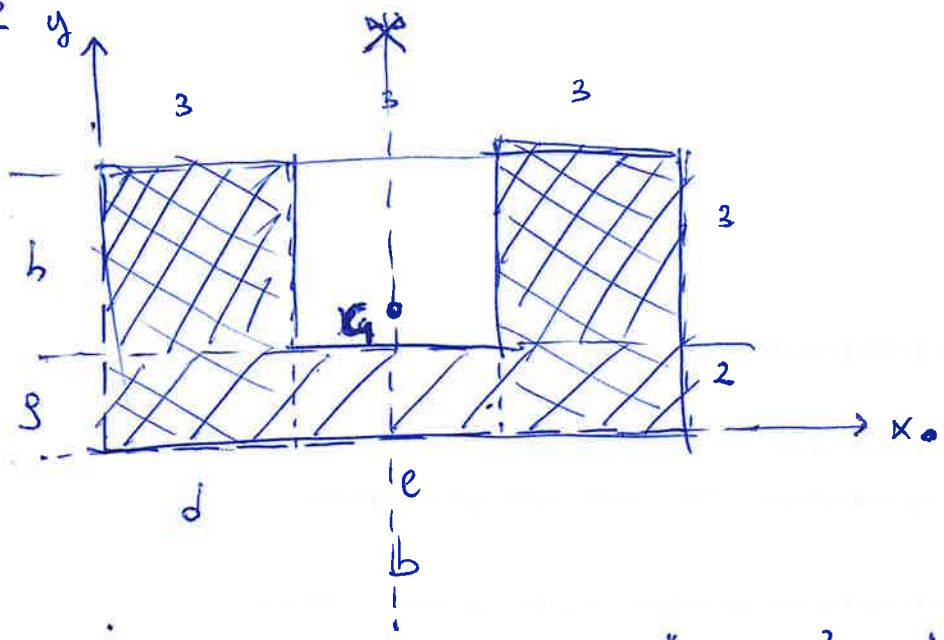
2) $M_B = ?$



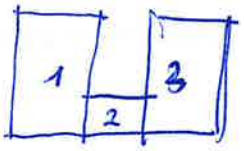


$\delta L_{EXT} = 0 \qquad -M_B\cancel{\delta\varphi_1} + 2pb\,b\cancel{\delta\varphi_1} = 0 \qquad \forall\delta\varphi_1 \qquad M_B = 2pb^2$

Ex3



$x_4 = 9/2\,a = 4{,}5\,a$



$S_x = A_1 \cdot y_{g1} + A_2 y_{g2} + A_3 y_{g3}$

$S_y = A_1 x_{g1} + A_2 x_{g2} + A_3 x_{g3}$

$A_1 = 15e^2 \quad A_2 = 6e^2 \quad A_3\ 15e^2 \quad A = 36e^2$

$y_{g1} = 5/2\,e \quad y_{g2} = e \quad y_{g3} = 5/2\,e$

$x_{g1} = 3/2\,a \quad x_{g2} = 9/2\,a \quad x_{g3} = 15/2\,a$

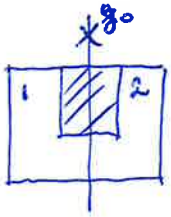
$S_x = (15e^2 \cdot 5/2\,e) + (6e^2 \cdot e) + (15e^2 \cdot 5/2\,e) = \frac{75}{2}e^3 + 6e^3 + \frac{75}{2}e^3 = \frac{162}{2}e^3 = 81e^3$

$S_y = (15e^2 \cdot 3/2\,a) + (6e^2 \cdot 9/2\,a) + (15e^2 \cdot \frac{15}{2}a) = \frac{45}{2}e^3 + \frac{54}{2}e^3 + \frac{225}{2}e^3 = \frac{324}{2}e^3 = 162\,e^3$

$x_g = S_y/A = 162e^3/36e^2 = 4{,}5\,e = 9/2\,e$

$y_g = S_x/A = 81e^3/36e^2 = 2{,}25\,e = 9/4\,a$

$y_{yg} \rightarrow$



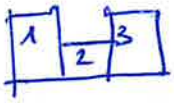
$y_{yg} = y_{yg1} - y_{yg2}$

$y_{yg1} = \frac{bh^3}{12} = \frac{5 \cdot (3^3)}{12}e^4 = \frac{3645}{12}e^4$

$y_{yg2} = \frac{bh^3}{12} = \frac{3 \cdot (3^3)}{12}e^4 = \frac{81}{12}e^4$

$y_{yg} = y_{yg1} - y_{yg2} = \left(\frac{3645 - 81}{12}\right)e^4 = \frac{3564}{12}e^4 = 297\,e^4$

$y_{xg} \rightarrow \quad y_x + A\,y_g^2 \qquad y_x =$



$y_{x1} + y_{x2} + y_{x3}$

$y_{x1} = \frac{bh^3}{3} = \frac{3 \cdot (5^3)}{3}e^4 = \frac{375}{3}e^4$

$y_{x2} = \frac{bh^3}{3} = \frac{3 \cdot (2^3)}{3}e^4 = \frac{24}{3}e^4$

$y_{x3} = y_{x1} = \frac{375}{3}e^4$

$y_x = \frac{724}{3}e^4 = 258\,e^4$

$y_g^2 = \left(\frac{9}{4}\right)^2 = \frac{81}{16}e^4$

$A \cdot y_g^2 = 36e^2 \cdot \frac{81}{16}e^4 = \frac{2916}{16}e^4 = \frac{729}{4}e^4$

$y_{xg} = y_x - A\,y_g^2 = 258e^4 - \frac{729}{4}e^4 = \frac{1032 - 729}{4}e^4 = \frac{303}{4}e^4$

$y_0 \rightarrow$ ✳ $\quad \mathcal{D}_{xy_a} = 0$! $\quad tg\,2\alpha = 0 \quad \mathcal{J}_{x_a} \times \mathcal{J}_{y_a} \quad \alpha = 0/2$ ④

$\mathcal{J}_\xi = \mathcal{J}_{y_a} \quad \mathcal{J}_\eta = \mathcal{J}_{x_a}$