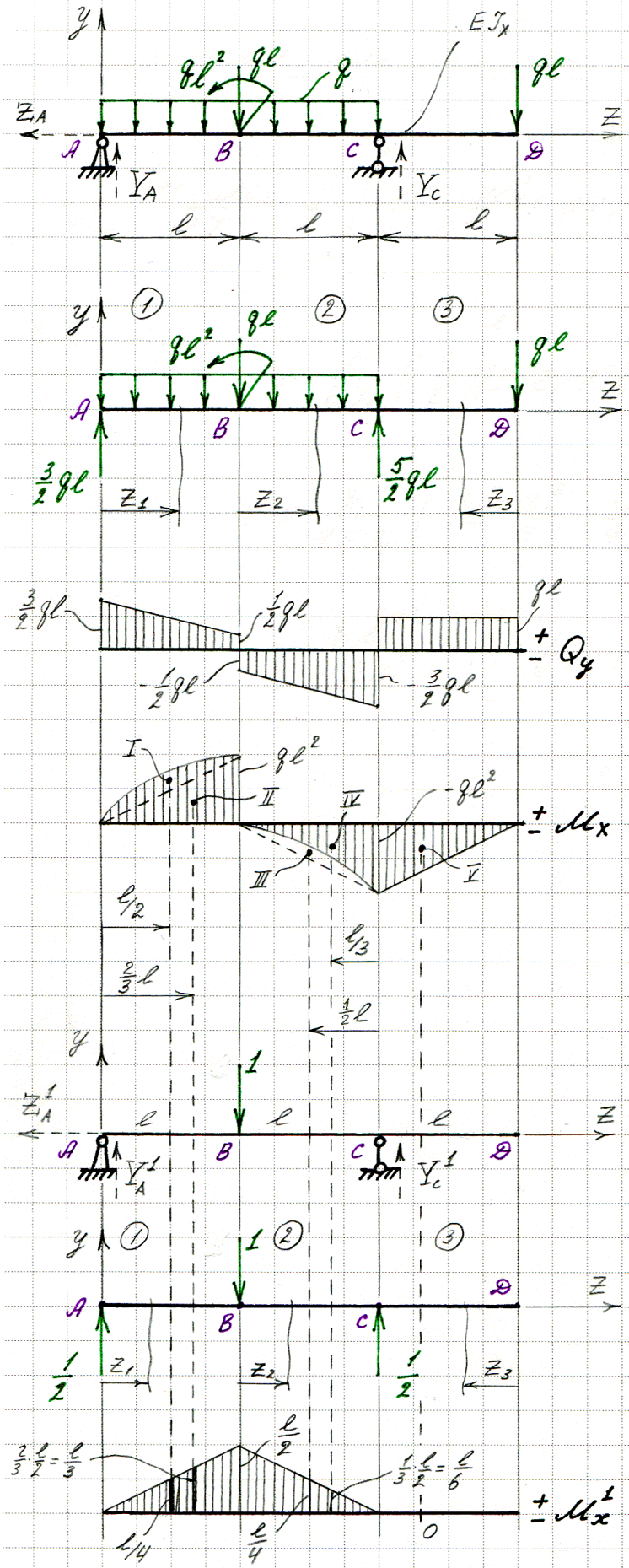
$V_B = ?$ – вертикальное перемещение точки B.



$Z_A = 0$;

$Y_C = \frac{5}{2} ql$

$Y_A = \frac{3}{2} ql$

$$\left.\begin{aligned} Q_{y_1} &= \frac{q}{2}(3l - 2z_1) \\ Q_{y_2} &= -\frac{q}{2}(l + 2 \cdot z_2) \\ Q_{y_3} &= ql \\ M_{x_1} &= \frac{q}{2}(3lz_1 - z_1^2) \\ M_{x_2} &= -\frac{q}{2}(l \cdot z_2 + z_2^2) \\ M_{x_3} &= -ql \cdot z_3 \end{aligned}\right\} \text{РОЗУ}$$

$Z^1_A = 0$

$Y_C^1 = \frac{1}{2} = Y_A^1$

$$\left.\begin{aligned} M^1_{x_1} &= \frac{z_1}{2} \\ M^1_{x_2} &= \frac{l - z_2}{2} \\ M^1_{x_3} &= 0 \end{aligned}\right\} \text{РОЗУ}$$

Спо-соб Верещагина:

$$V_B = \frac{M_x \cdot M_x^1}{EJ_x} = \frac{1}{EJ_x} \cdot \Big[\underset{\text{I}}{\Big(\frac{ql^3}{12}\Big)} \cdot \frac{l}{4} + \underset{\text{II}}{\Big(\frac{1}{2} l \, ql^2\Big)} \frac{l}{3} + \underset{\text{III}}{\Big(\frac{ql^3}{12}\Big)} \frac{l}{4} + \underset{\text{IV}}{\Big(-\frac{1}{2} l \, ql^2\Big)} \frac{l}{6} + \underset{\text{V}}{\Big(-\frac{1}{2} l \, ql^2\Big)} 0 \Big] =$$

$$= \frac{ql^4}{EJ_x} \cdot \Big[\frac{1}{48} + \frac{1}{6} + \frac{1}{48} - \frac{1}{12} \Big] = \frac{ql^4}{8EJ_x}$$

Классическое вычисление интеграла Мора:

$$V_B = \frac{Mx \cdot M\bar{x}}{EJ_x} = \int_0^{\ell} \frac{Mx_1 \cdot M\bar{x}_1}{EJ_x} dz_1 + \int_0^{\ell} \frac{Mx_2 \cdot M\bar{x}_2}{EJ_x} dz_2 + \int_0^{\ell} \frac{Mx_3 \cdot M\bar{x}_3}{EJ_x} dz_3 =$$

$$= \frac{1}{EJ_x} \cdot \left[\frac{q}{2} \int_0^{\ell} (3\ell z_1 - z_1^2) \cdot \frac{z_1}{2} \cdot dz_1 - \frac{q}{2} \int_0^{\ell} (\ell z_2 + z_2^2) \cdot \frac{\ell - z_2}{2} \cdot dz_2 \right] =$$

$$= \frac{q}{4EJ_x} \cdot \left[\left(3\ell \frac{z_1^3}{3} - \frac{z_1^4}{4} \right) \Big|_0^{\ell} - \left(\ell^2 \frac{z_2^2}{2} + \ell \frac{z_2^3}{3} - \ell \frac{z_2^3}{3} - \frac{z_2^4}{4} \right) \Big|_0^{\ell} \right] =$$

$$= \frac{q \cdot \ell^4}{4EJ_x} \cdot \left[\left(1 - \frac{1}{4} \right) - \left(\frac{1}{2} - \frac{1}{4} \right) \right] = \frac{q\ell^4}{8EJ_x}$$