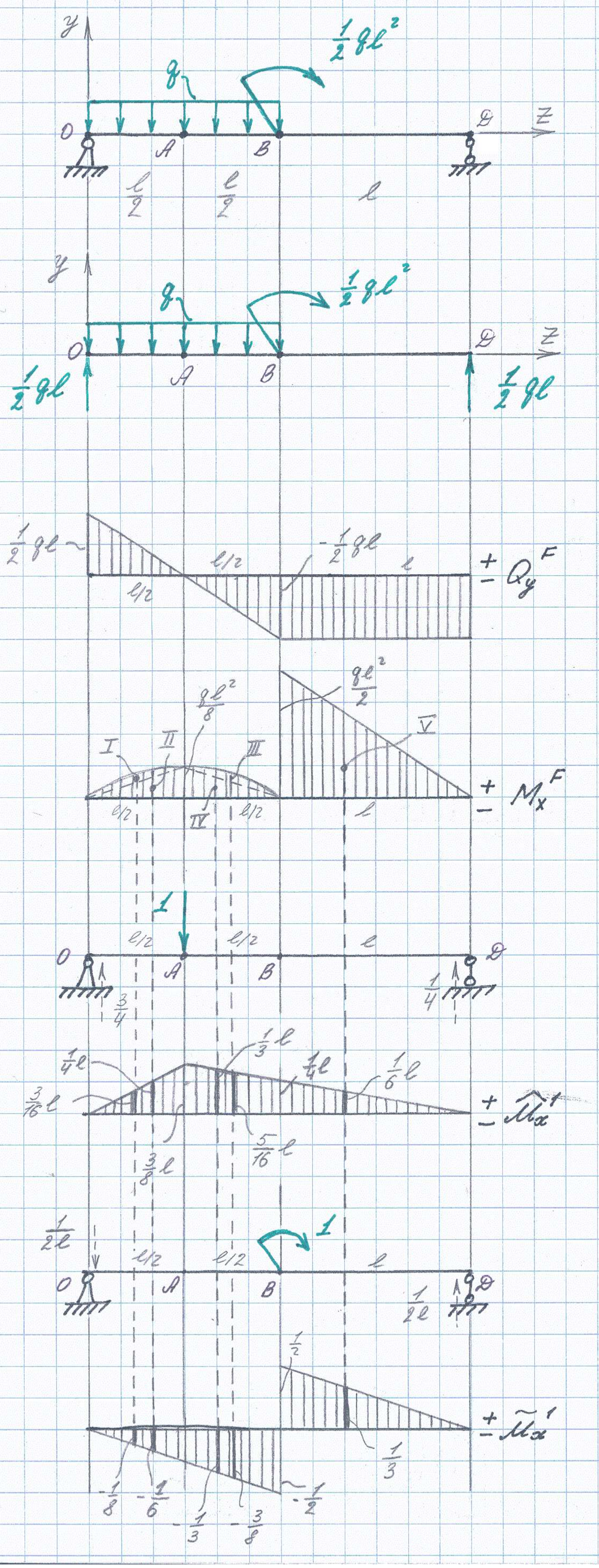
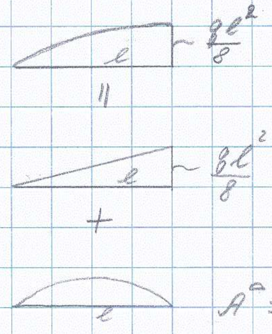
Пример $\boxed{VI.3}$

$y_A = ?$

$\theta_B = ?$





$A^{\triangle} = \frac{1}{2}\cdot\frac{ql^2}{8}\cdot l$

$A^{\frown} = \frac{q\left(\frac{l}{2}\right)^3}{12} = \frac{ql^3}{8\cdot 12}$

Сравнить: пример $\boxed{V.1}$ стр 109 ... 110 $\frac{a}{}$

$$y_A = V_A = \frac{M_x^F \times \widehat{M}_x^1}{EJ_x} =$$

$$= \frac{1}{EJ_x}\Big[\overset{I}{\left(\frac{ql^3}{8\cdot 12}\right)}\cdot\frac{3}{16}l + \overset{II}{\left(\frac{1}{2}\,\frac{ql^2}{8}\,\frac{l}{2}\right)}\cdot\frac{1}{4}l + \overset{III}{\left(\frac{ql^3}{8\cdot 12}\right)}\cdot\frac{5}{16}l +$$

$$+ \overset{IV}{\left(\frac{1}{2}\,\frac{ql^2}{8}\,\frac{l}{2}\right)}\cdot\frac{1}{3}l + \overset{V}{\left(\frac{1}{2}\,\frac{ql^2}{2}\,l\right)}\cdot\frac{1}{6}l \Big] = \frac{25}{384}\cdot\frac{ql^4}{EJ_x}$$

$$\theta_B = \frac{M_x^F \times \widetilde{M}_x^1}{EJ_x} =$$

$$= \frac{1}{EJ_x}\Big[-\overset{I}{\left(\frac{ql^3}{8\cdot 12}\right)}\frac{1}{8} - \overset{II}{\left(\frac{1}{2}\,\frac{ql^2}{8}\,\frac{l}{2}\right)}\cdot\frac{1}{6} - \overset{III}{\left(\frac{ql^3}{8\cdot 12}\right)}\cdot\frac{3}{8} -$$

$$- \overset{IV}{\left(\frac{1}{2}\,\frac{ql^2}{8}\,\frac{l}{2}\right)}\frac{1}{3} + \overset{V}{\left(\frac{1}{2}\cdot\frac{ql^2}{2}\cdot l\right)}\frac{1}{3} \Big] = \frac{1}{16}\cdot\frac{ql^3}{EJ_x}$$

Классическое вычисление интеграла Мора (θ_B):

$$\left.\begin{aligned} M_{x_1}^F &= \frac{1}{2} q l \cdot z_1 - \frac{q z_1^2}{2} \\ M_{x_2}^F &= \frac{1}{2} q l z_2 \end{aligned}\right\} \text{Эпюра } M_x^F$$

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

$$\theta_B = \int \frac{M_x^F \cdot M_x^1}{EJ_x} dz =$$

$$= \int_0^l \frac{M_{x_1}^F \cdot M_{x_1}^1}{EJ_x} dz_1 + \int_0^l \frac{M_{x_2}^F \cdot M_{x_2}^1}{EJ_x} dz_2 =$$

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

$$= \frac{1}{4l\, EJ_x} \cdot \left[-ql \int_0^l z_1^2 dz_1 + q \int_0^l z_1^3 dz_1 + ql \int_0^l z_2^2 dz_2 \right] =$$

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

$$= \frac{ql^3}{4EJ_x} \cdot \left[-\cancel{\frac{1}{3}} + \frac{1}{4} + \cancel{\frac{1}{3}} \right] = \frac{ql^3}{16 EJ_x}$$