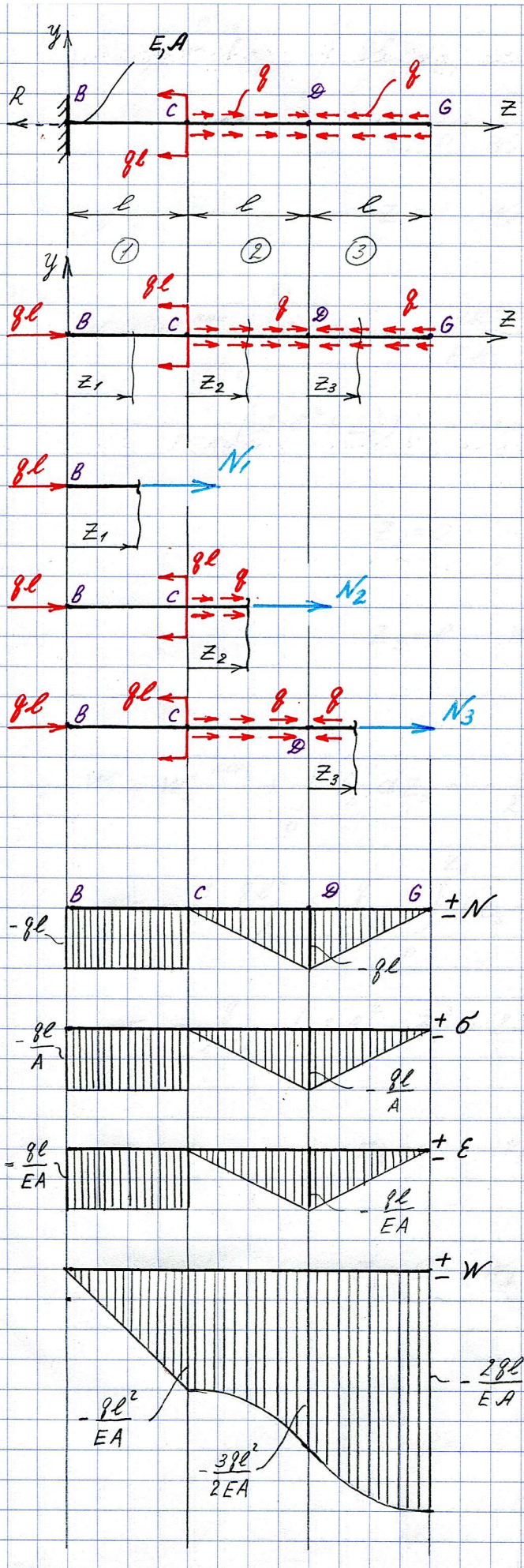

$$\sum F_z = 0 = -R - q\ell + q\ell - q\ell \Rightarrow R = -q\ell$$

$$\sum F_{z_1} = 0 = N_1 + q\ell \Rightarrow N_1 = -q\ell$$

$$\sum F_{z_2} = 0 = q\ell - q\ell + q \cdot z_2 + N_2 \Rightarrow N_2 = -qz_2$$

$z_2 = 0$: $N_2 = 0$

$z_2 = \ell$: $N_2 = -q\ell$

$$\sum F_{z_3} = 0 = q\ell - q\ell + q\ell - qz_3 + N_3 \Rightarrow N_3 = q(z_3 - \ell)$$

$z_3 = 0$: $N_3 = -q\ell$

$z_3 = \ell$: $N_3 = 0$

$$\sigma_1 = \frac{N_1}{A_1} = -\frac{q\ell}{A};$$

$$\sigma_2 = \frac{N_2}{A_2} = -\frac{q}{A} \cdot z_2;$$

$z_2 = 0$: $\sigma_2 = 0$;

$z_2 = \ell$: $\sigma_2 = -\frac{q\ell}{A}$;

$$\sigma_3 = \frac{N_3}{A_3} = \frac{q(z_3 - \ell)}{A};$$

$z_3 = 0$: $\sigma_3 = -\frac{q\ell}{A}$;

$z_3 = \ell$: $\sigma_3 = 0$;

$$\varepsilon_1 = \frac{\sigma_1}{E_1} = -\frac{q\ell}{EA};$$

$$\varepsilon_2 = \frac{\sigma_2}{E_2} = -\frac{q}{EA} z_2;$$

$z_2 = 0$: $\varepsilon_2 = 0$; $z_2 = \ell$: $\varepsilon_2 = -\frac{q\ell}{EA}$;

$$\varepsilon_3 = \frac{\sigma_3}{E_3} = -\frac{q(z_3 - \ell)}{EA};$$

$z_3 = 0$: $\varepsilon_3 = -\frac{q\ell}{EA}$;

$z_3 = \ell$: $\varepsilon_3 = 0$;

$$W_1 = \cancel{W_0^{0}} + W_0^{кон} + \int_0^{z_1} \varepsilon_1 dz_1 = -\int_0^{z_1} \frac{ql}{EA} dz_1 = -\frac{ql}{EA} \cdot z_1;$$

$$z_1 = 0: \; W_1^{нач} = 0;$$

$$z_1 = l: \; W_1^{кон} = -\frac{ql^2}{EA};$$

$$W_2 = W_1^{кон} + \int_0^{z_2} \varepsilon_2 dz_2 = -\frac{ql^2}{EA} - \int_0^{z_2} \frac{q}{EA} z_2 dz_2 = -\frac{ql^2}{EA} - \frac{q}{EA} \cdot \frac{z_2^2}{2} =$$

$$= -\frac{q}{2EA}\left(2 \cdot l^2 + z_2^2\right); \; - \text{парабола с вершиной в т. C}$$

$$z_2 = 0: \quad W_2^{нач.} = -\frac{ql^2}{EA};$$

$$z_2 = l: \quad W_2^{кон} = -\frac{3}{2} \cdot \frac{ql^2}{EA};$$

$$W_3 = W_2^{кон} + \int_0^{z_3} \varepsilon_3 dz_3 = -\frac{3}{2} \cdot \frac{ql^2}{EA} + \int_0^{z_3} \frac{q(z_3 - l)}{EA} dz_3 =$$

$$= -\frac{3}{2}\frac{ql^2}{EA} + \frac{q}{EA} \cdot \int_0^{z_3} (z_3 - l) dz_3 = -\frac{3}{2}\frac{ql^2}{EA} + \frac{q}{2EA} \cdot z_3^2 - \frac{ql}{EA} \cdot z_3 =$$

$$= -\frac{q}{2EA} \cdot \left(3l^2 - z_3^2 + 2lz_3\right); \; - \text{парабола с вершиной в т. G}$$

$$z_3 = 0: \quad W_3^{нач.} = -\frac{3}{2} \cdot \frac{ql^2}{EA};$$

$$z_3 = l: \quad W_3^{кон.} = -\frac{2ql^2}{EA}.$$