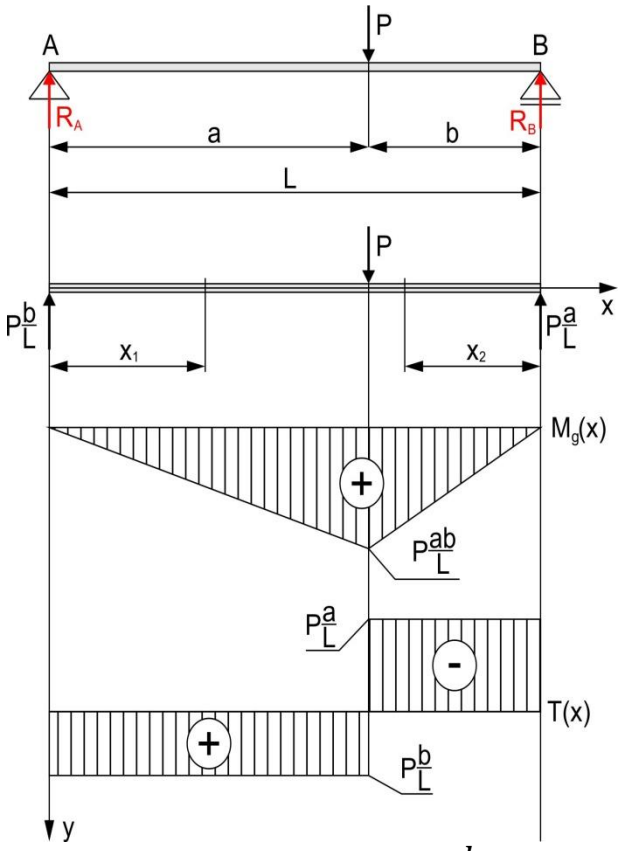
Wykresy momentów gnących i sił tnących - przykłady elementarne:



Reakcje więzów:

$$\sum M_A = 0 \rightarrow R_B \cdot L = P \cdot a \rightarrow R_B = P\frac{a}{L}$$

$$\sum M_B = 0 \rightarrow R_A \cdot L = P \cdot b \rightarrow R_A = P\frac{b}{L}$$

$$0 \leq x_1 \leq a$$

$$M_{gx_1} = P\frac{b}{L} \cdot x_1$$

$$M_{gx_1|x_1=0} = 0\,; \quad M_{gx_1|x_1=a} = P\frac{a \cdot b}{L}$$

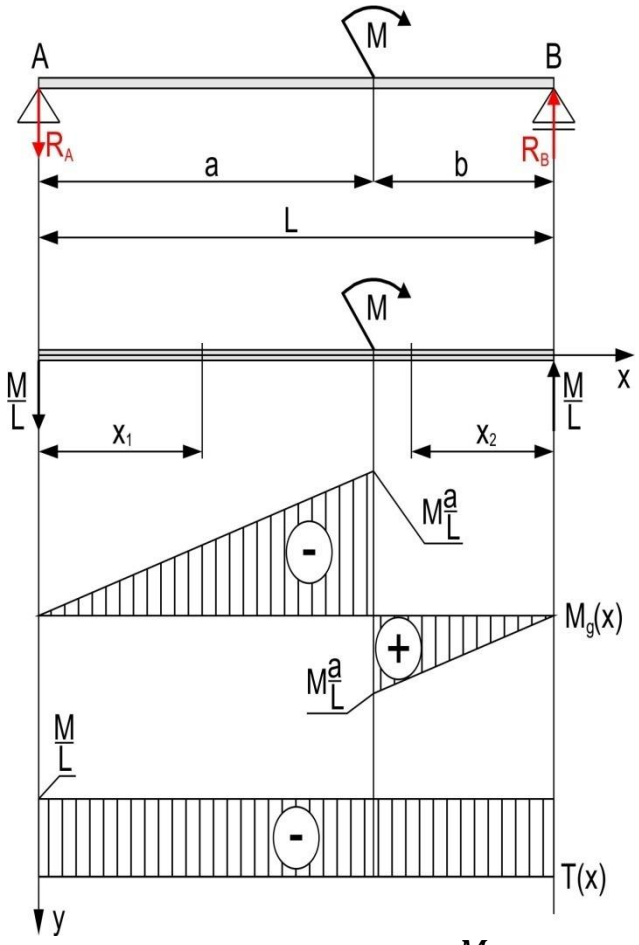
$$T_{x_1} = P\frac{b}{L} = const.$$

$$0 \leq x_2 \leq b$$

$$M_{gx_2} = P\frac{a}{L} \cdot x_2$$

$$M_{gx_2|x_2=0} = 0\,; \quad M_{gx_2|x_2=b} = P\frac{a \cdot b}{L}$$

$$T_{x_2} = P\frac{a}{L} = const.$$



Reakcje więzów:

$$\sum M_A = 0 \rightarrow R_B \cdot L = M \rightarrow R_B = \frac{M}{L}$$

$$\sum M_B = 0 \rightarrow R_A \cdot L = M \rightarrow R_A = \frac{M}{L}$$

$$0 \leq x_1 \leq a$$

$$M_{gx_1} = -\frac{M}{L} \cdot x_1$$

$$M_{gx_1|x_1=0} = 0\,; \quad M_{gx_1|x_1=a} = -M\frac{a}{L}$$

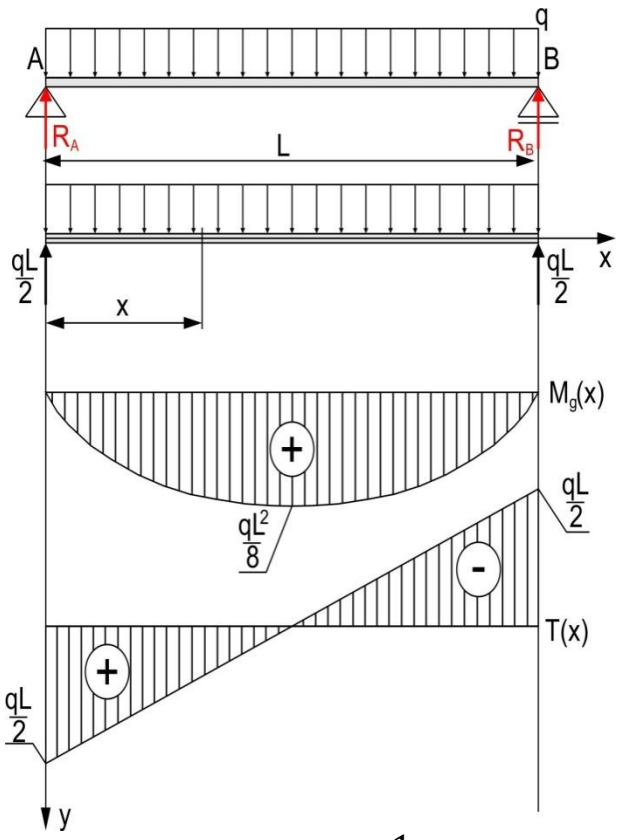
$$T_{x_1} = -\frac{M}{L} = const.$$

$$0 \leq x_2 \leq b$$

$$M_{gx_2} = \frac{M}{L} \cdot x_2$$

$$M_{gx_2|x_2=0} = 0\,; \quad M_{gx_2|x_2=b} = M\frac{b}{L}$$

$$T_{x_2} = -\frac{M}{L} = const.$$



Reakcje więzów:

$$R_A = R_B = \frac{1}{2}qx^2$$

$$0 \le x \le L$$

$$M_{gx} = \frac{qL}{2} \cdot x - \frac{1}{2}q \cdot x^2$$

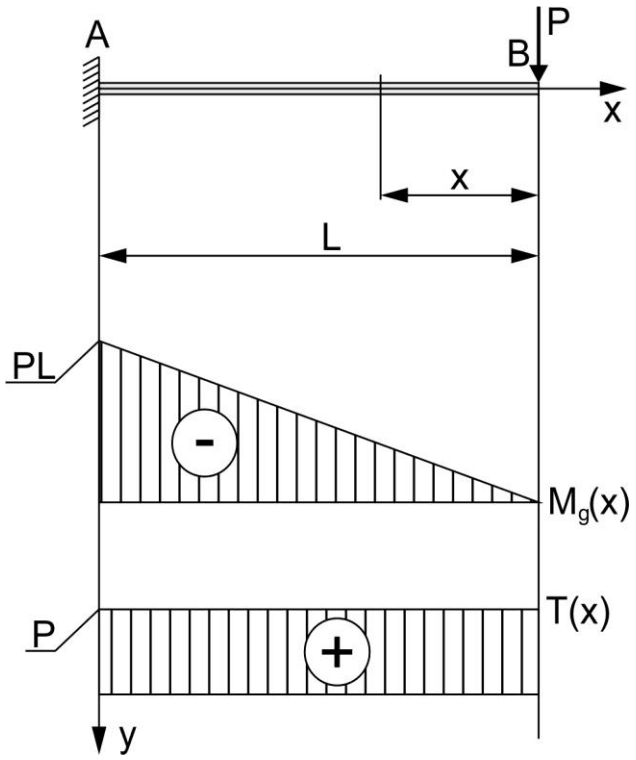
$$M_{gx}\big|_{x=0} = 0 \;;\; M_{gx}\big|_{x=L} = 0$$

$$T_x = \frac{1}{2}qL - qx$$

$$T_x|_{x=0} = \frac{1}{2}qL \quad ; \quad T_x|_{x=L} = -\frac{1}{2}qL$$

$$\frac{1}{2}qL - qx_0 = 0 \;\rightarrow\; x_0 = \frac{1}{2}L$$

$$M_{gx}\big|_{x=\frac{1}{2}L} = \frac{qL^2}{4} - \frac{qL^2}{8} = \frac{qL^2}{8}$$



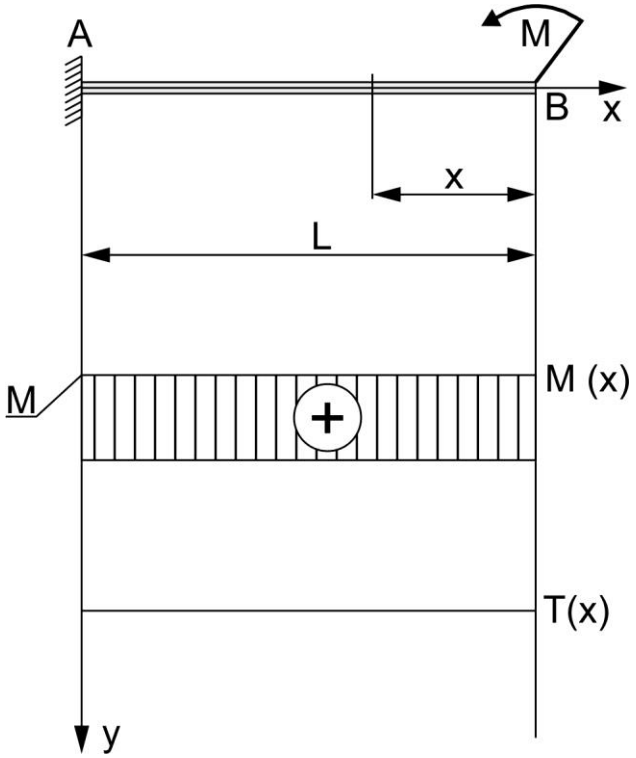
$0 \le x \le L$

$M_{gx} = -P \cdot x$

$M_{gx}\big|_{x=0} = 0$

$M_{gx}\big|_{x=L} = -PL$

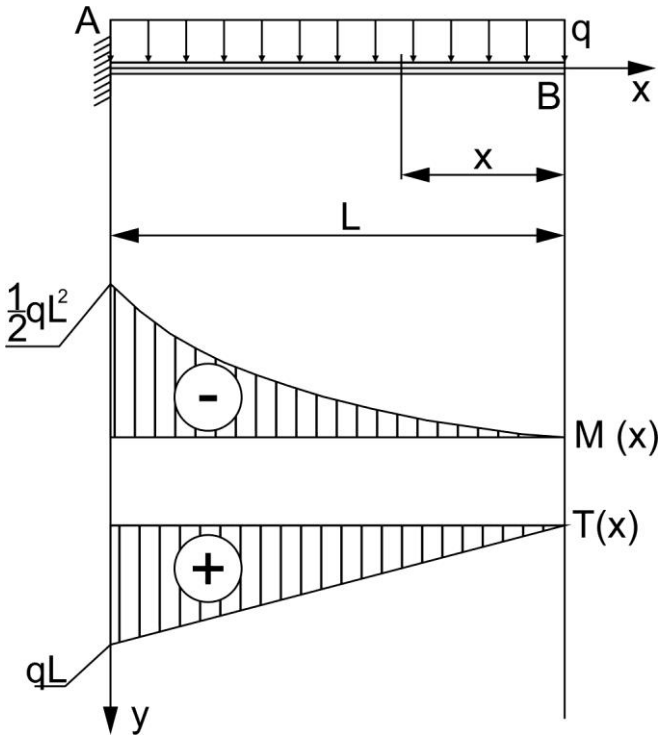
$T_x = P = const.$



$0 \le x \le L$

$M_{gx} = M = const.$

$T_x = 0$



$$0 \le x \le L$$

$$M_{gx} = -\frac{1}{2} q x^2$$

$$M_{gx}\big|_{x=0} = 0$$

$$M_{gx}\big|_{x=L} = -\frac{1}{2}\, qL^2$$

$$T_x = qx$$

$$T_x|_{x=0} = 0 \quad ; \quad T_x|_{x=L} = qL$$