Analysis of continuous beam by force method

Input data

Span lengths -

Number of spans -

Coordinates of supports -

Total beam length -

Load -

Elastic modulus of the material -

Cross section

Rectangular section with dimensions: ,

Area -

Moment of inertia -

Shear area -

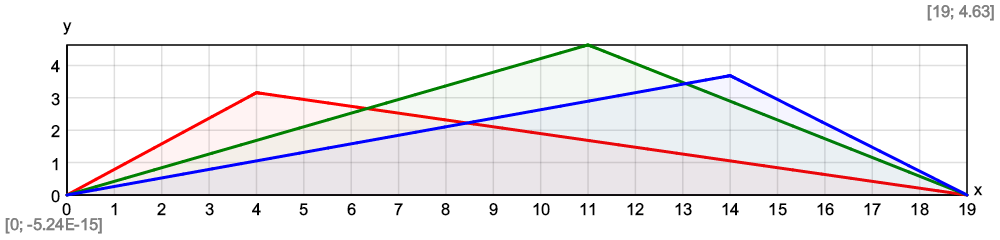
Solution

The solution will be performed by the force method with a primary system - simply supported beam with internal supports removed and replaced by unknown forces *X*i

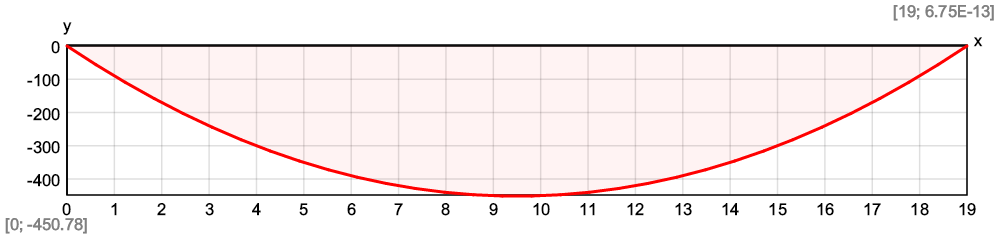
Bending moments

- in section *a* due to unit force at distance *x* from the beginning of the beam:

- in section *a*, due to unit force *X*i:



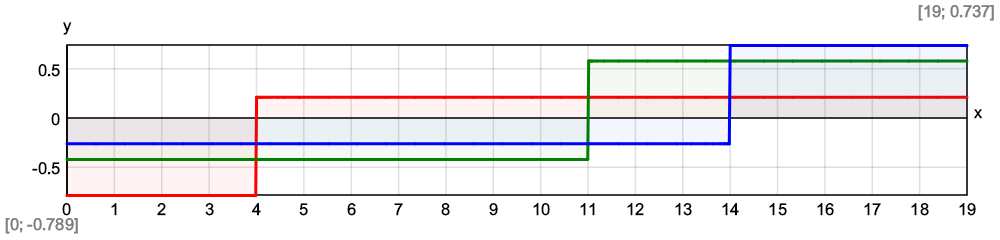
- due to external loads in primary system:



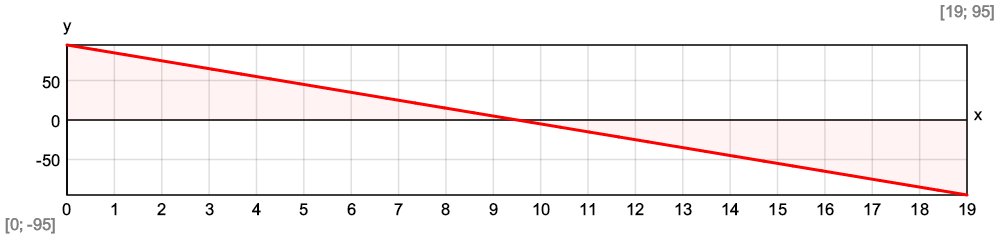
Shear forces

- in section *a* due to unit force at distance *x* from the beginning of the beam:

- in section *a*, due to unit force *X*i:



- due to external loads in primary system:



Number of unknowns by force method -

Flexibility coefficients

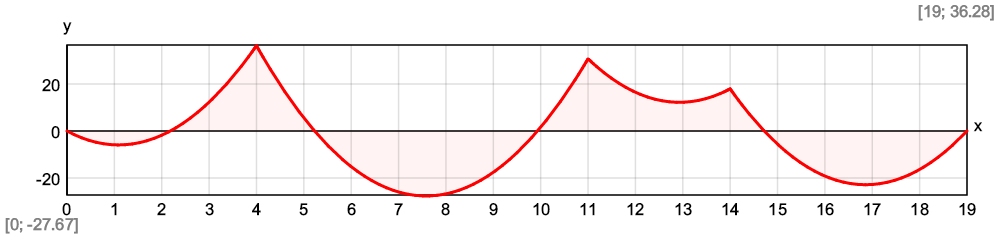
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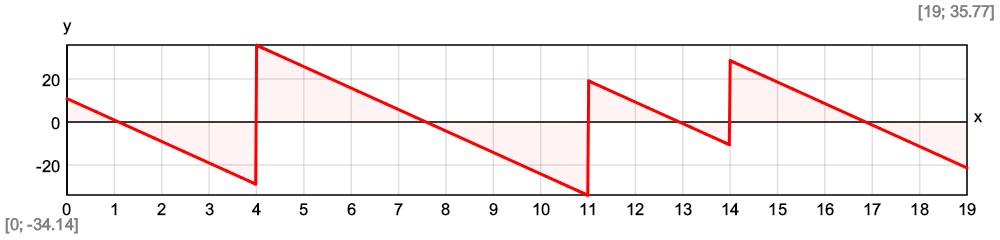
Calculation of the unknown forces *X*i

Results

Bending moment diagram -



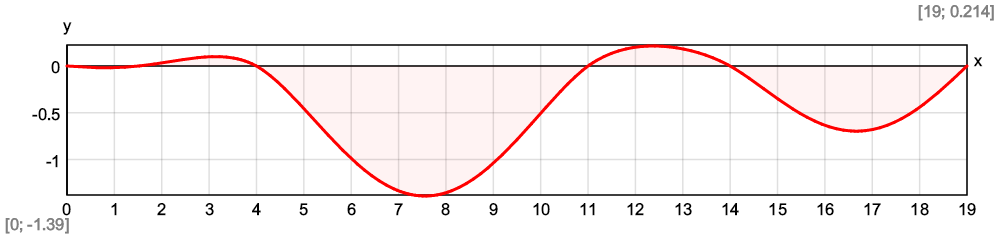
Shear force diagram -



Deflections

- in section *a*, due to unit force *X*i:

- due to external loads in primary system:



Maximum deflection -

At a distance from the origin -

Comparison with Stadyps 6.0 structural analysis software

Loads and support reactions, kN Картина, която съдържа линия

Описанието е генерирано автоматично

Bending moments, kNm

Shear forces, kN



Deflections, mm

