Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Student number\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*y*

*L*

*x*

*b*

*P*

**Assignment 1 (2p)**

Find the stress resultants of the plane cantilever beam of the figure. Use the beam equilibrium equations and natural boundary conditions in the Cartesian system

 in  and  at 

 in  and  at 

**Solution**

In a statically determinate case, it is possible to solve for the stress resultants from a boundary value problem consisting of the equilibrium equations and the natural boundary conditions. The three differential equations and their boundary conditions are (when written in the standard form )

*b*

 in  and  at 

 in  and  at 

 in  and  at 

Solution to the boundary value problem is

, **🡸**

, **🡸**

. **🡸**

Use the Mathematica notebook Beam.nb of the homepage to check your solution!