

# Simply Supported Beam Analysis Report

Automated PyLaTeX Generator

February 7, 2026

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## 1 Introduction

This report presents a simple structural analysis of a simply supported beam subjected to point loads. The reactions, shear force diagram (SFD), and bending moment diagram (BMD) are computed and plotted using pgfplots.

## 2 Beam Description

Beam supports: simple supports at  $x=0$  and  $x=L$ . Units are consistent (e.g., meters and Newtons).

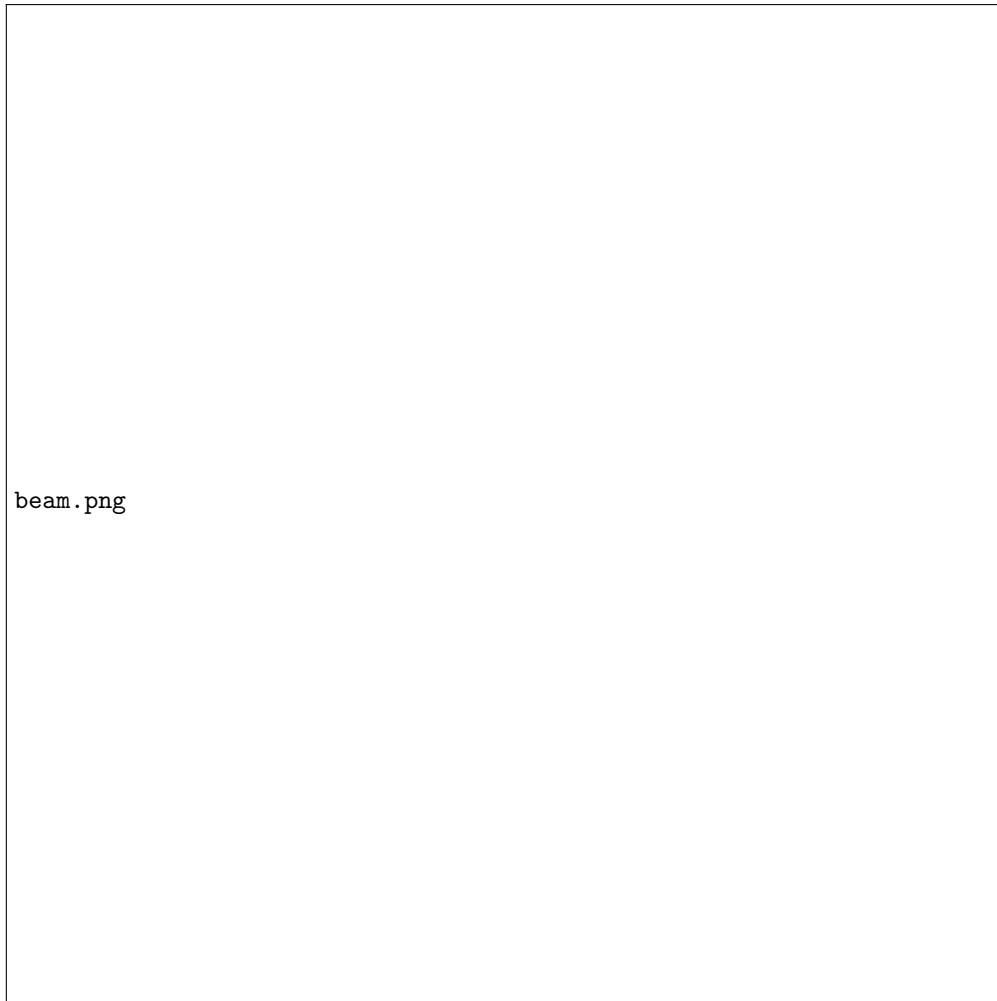


Figure 1: Simply supported beam schematic

## 3 Data Source

Input data read from the Excel file data/forces.xlsx. The following table reproduces the input data used for analysis.

## 4 Input Data

Table 1: Point loads read from Excel (position in m, load in N)

Position (m)	Load (N)
1.000	1.000
3.000	3.000
6.000	6.000

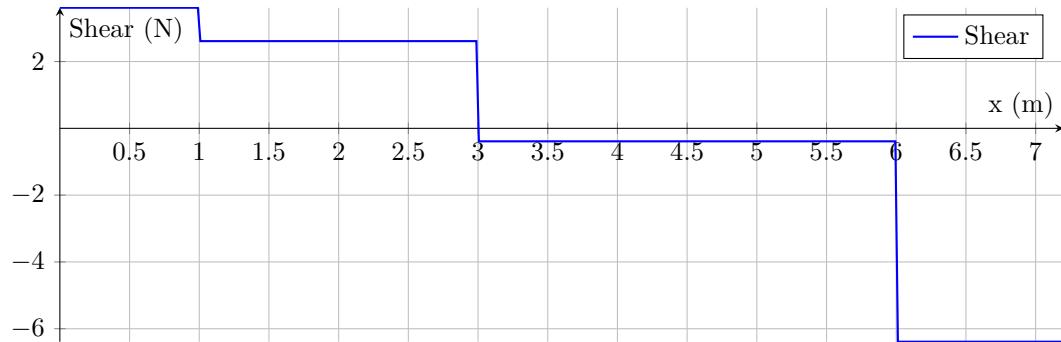
## 5 Analysis

### 5.1 Support Reactions

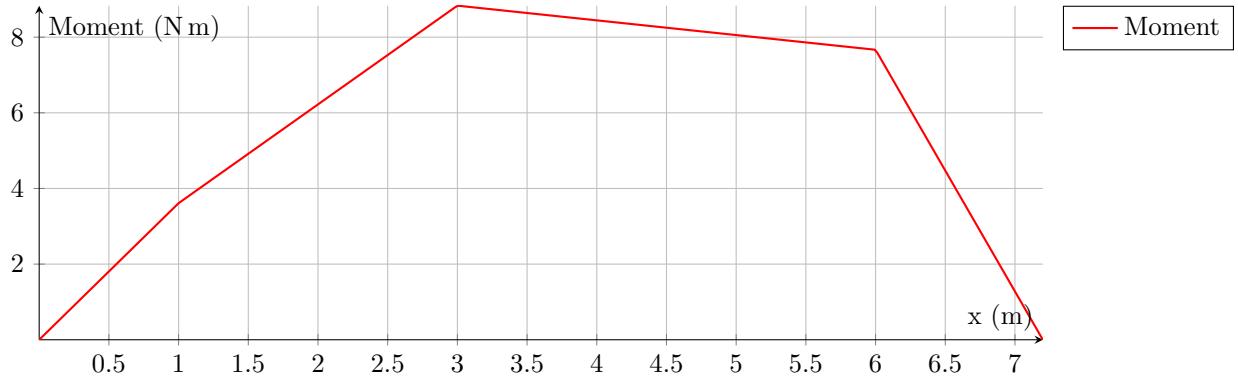
Reaction at A ( $x=0$ ):  $R_A = 3.611$  N

Reaction at B ( $x=L$ ):  $R_B = 6.389$  N

### 5.2 Shear Force Diagram (SFD)



### 5.3 Bending Moment Diagram (BMD)



### 5.4 Summary

Key results: Maximum shear: -6.389 N at  $x = 6.012$  m

Maximum moment: 8.831 N m at  $x = 3.006$  m

A Shear Force Diagram (SFD) represents the internal shear force distribution along the beam as a function of position. It shows how shear changes where loads are applied and at supports; abrupt jumps correspond to point loads or reactions.

A Bending Moment Diagram (BMD) represents the internal bending moment distribution along the

beam. It indicates where the beam experiences the largest bending effects; these locations are critical for section design and checks.