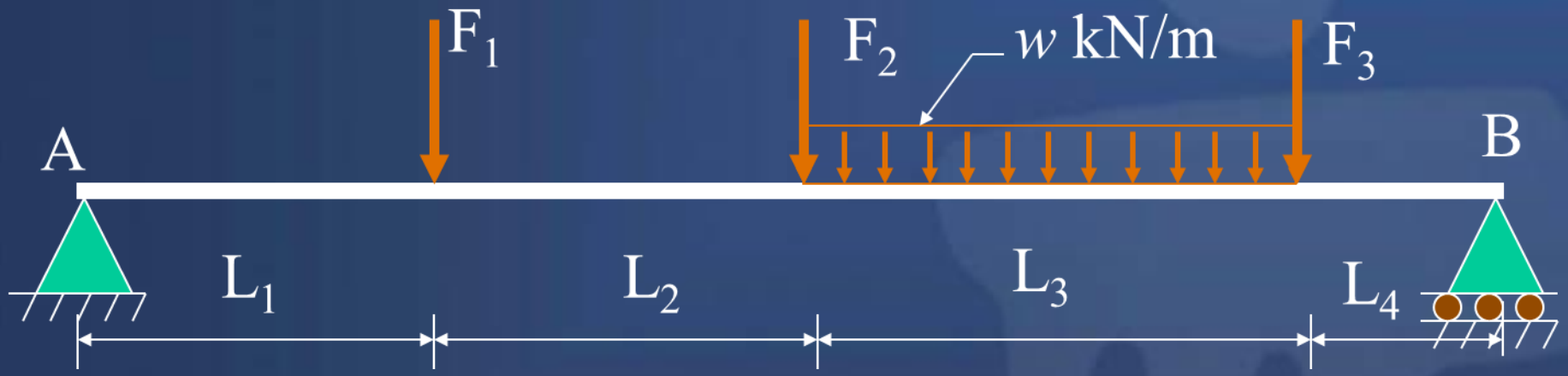
Shear Force and Bending Moment Diagrams

[SFD & BMD]

- Introduction
- Shear force and Bending moment at a section
- Sign Convention

Introduction:



The algebraic sum of the vertical forces acting on the beam either to the left or right of the section is known as the shear force at a section.
Sign convention for shear force when **LEFT** side portion of the section is considered

Positive (+) Sign For the vertical forces acting upward
Negative (-) Sign For the vertical forces acting downward

Sign convention for shear force when **RIGHT** side portion of the section is considered

Positive (+) Sign For the vertical forces acting downward
Negative (-) Sign For the vertical forces acting upward.

Shear force (SF) at a section:

Sign convention for shear forces:

Bending moment (BM) at section:

Sign convention for bending moments:

Point of Contra flexure [Inflection point]:

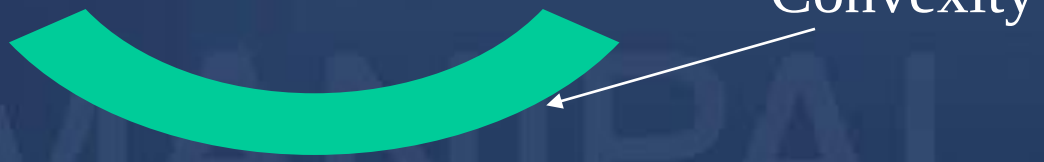


Fig. Sagging bending moment
[Positive bending moment]

Fig. Hogging bending moment
[Negative bending moment]

Variation of Shear force and bending moments

Type of load SFD/BMD	For no load region	Uniformly distributed load	Uniformly varying load
Shear Force Diagram	Horizontal line	Inclined line	Two-degree curve (Parabola)
Bending Moment Diagram	Inclined line	Two-degree curve (Parabola)	Three-degree curve (Cubic-curve)

Summary

HOME