Shear & Moment Diagrams

Civil Engineering

Shear and moment diagrams in one pass.

Works for simply supported spans, cantilevers and overhangs.

1. **Find the reactions**
   Sum vertical forces and take moments about one support.
2. **Cut from the left**
   Shear at a section is the sum of all forces to its left.
3. **Draw the shear diagram**
   A point load steps it, a UDL slopes it, and it must close at zero.
4. **Integrate for moment**
   Area under the shear diagram is the change in bending moment.
5. **Locate the peak**
   Maximum moment sits where the shear crosses zero.
6. **Check the ends**
   Moment is zero at a simple support and at a free cantilever tip.

UDL W ON A SIMPLE SPAN L

Reactions $wL/2$ at each end
Shear falls linearly from $+wL/2$ to $-wL/2$
Shear is zero at mid-span
Maximum moment = $wL^2/8$

Educational reference. Diagram shapes are analysis; sizing the member needs a code and a qualified engineer.