

Drawing Shear & Moment

Mechanical Engineering

Six steps to the diagrams, and the relationships that check themselves.

Work left to right, and let the calculus check your sketch.

1

Find the reactions

Whole-beam equilibrium first, before you take any cut.

2

Mark every discontinuity

Supports, point loads, and where distributed loads start and stop.

3

Build the shear diagram

Shear jumps at a point load and slopes under a distributed load.

4

Integrate shear into moment

Moment at a section is the shear area to the left of it.

5

Locate the maximum moment

Where shear crosses zero, or at a built-in end.

6

Check both ends

Shear and moment must both return to zero at a free end.

$dV/dx = -w$ and $dM/dx = V$. If your slopes disobey those two, the diagram is wrong.