



introduction to trusses

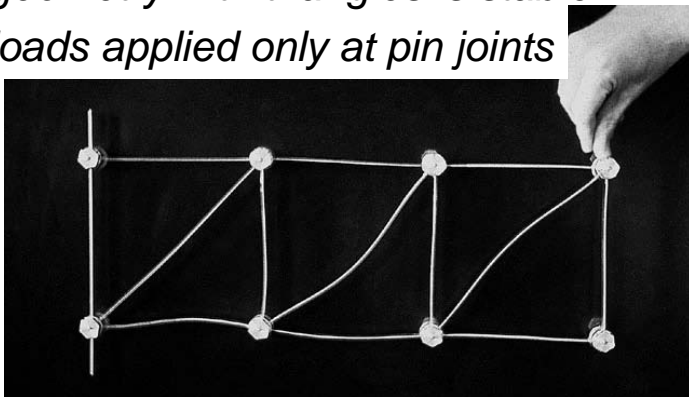
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Truss Structures

- comprised of straight members
- geometry with triangles is stable
- loads applied only at pin joints



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Truss Structures

- ancient (?) wood
– Romans 500 B.C.
- Renaissance revival
- 1800's analysis
- efficient



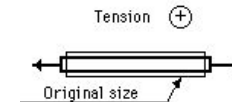
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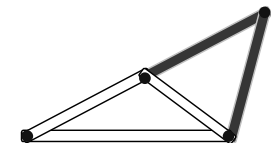
Truss Structures

- 2 force members
– compression
– tension



- 3 members connected by 3 joints
- 2 more members need 1 more joint

$$b = 2n - 3$$



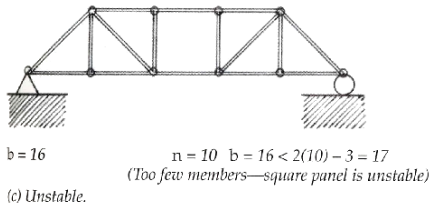
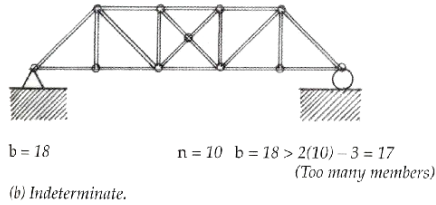
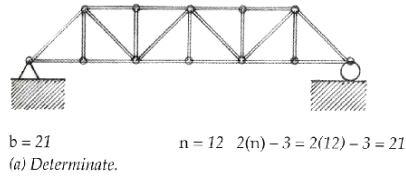
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Truss Structures

- statically determinate
- indeterminate
- unstable



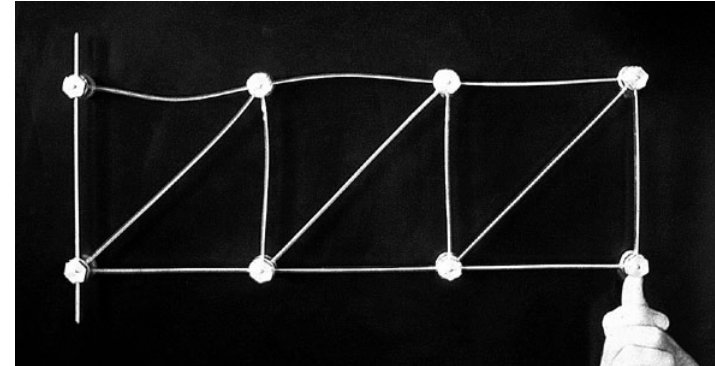
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Truss Analysis

- visualize compression and tension from deformed shape



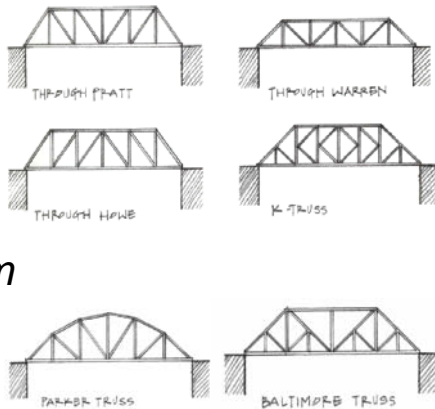
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Truss Analysis

- Method of Joints
- Graphical Methods
- Method of Sections
- all rely on equilibrium
 - of bodies
 - internal equilibrium



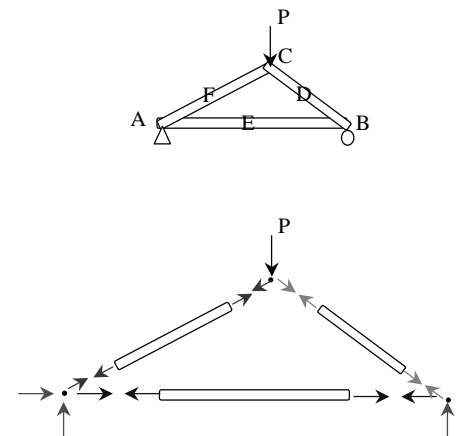
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Method of Joints

- isolate each joint
- enforce equilibrium in F_x and F_y
- can find all forces
- long
- easy to mess up



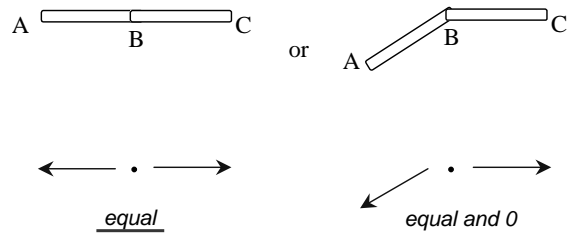
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Joint Cases

- two bodies connected



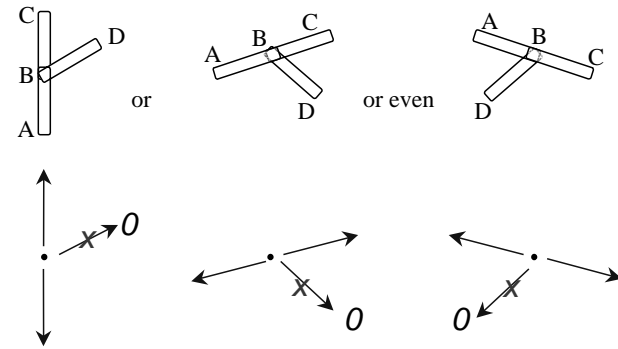
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Joint Cases

- three bodies with two in line



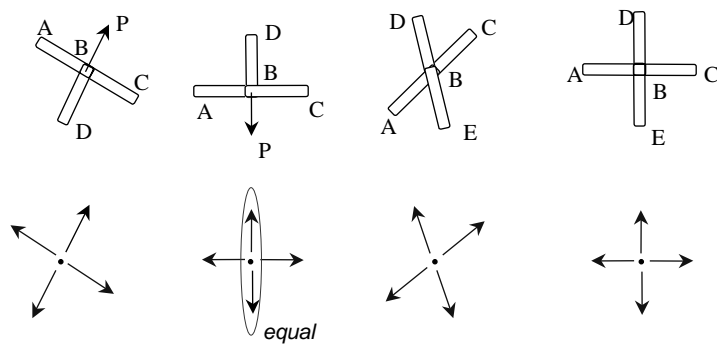
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Joint Cases

- crossed



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