

lecture  
**SIX**



**introduction  
to trusses**

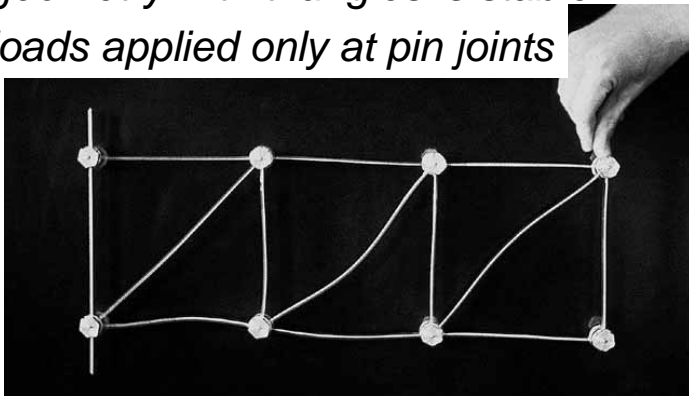
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Lecture 6

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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



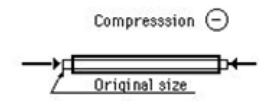
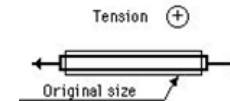
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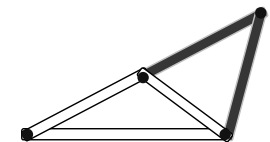
**Truss Structures**

- 2 force members  
– compression  
– tension



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

$$b = 2n - 3$$



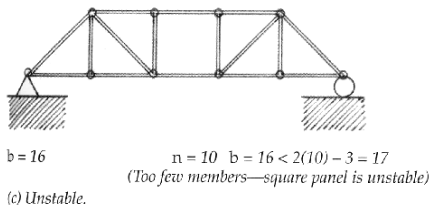
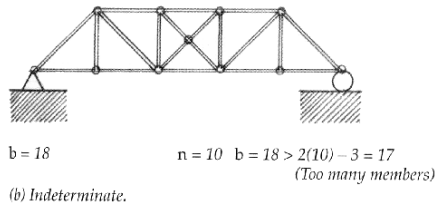
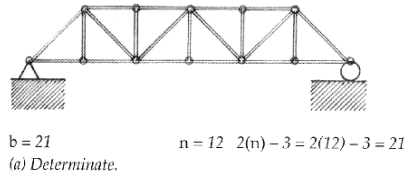
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# Truss Structures

- statically determinate
- indeterminate
- unstable



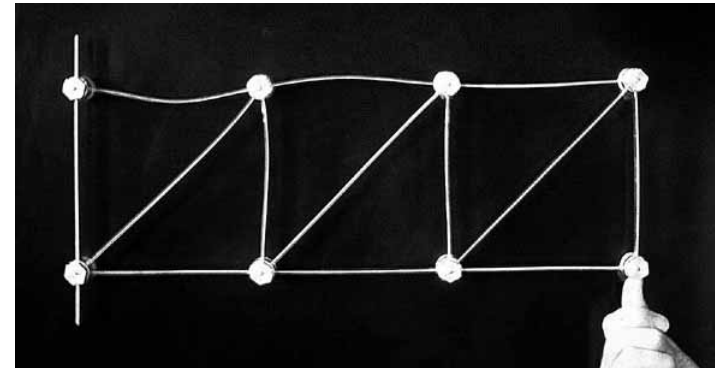
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# Truss Analysis

- visualize compression and tension from deformed shape



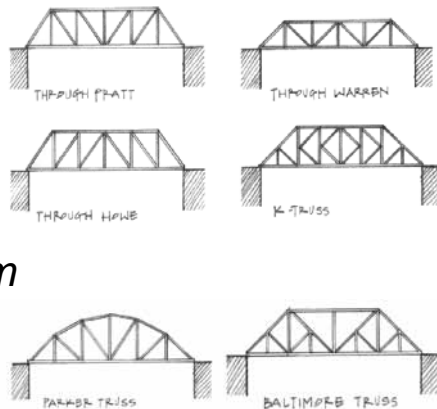
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# Truss Analysis

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



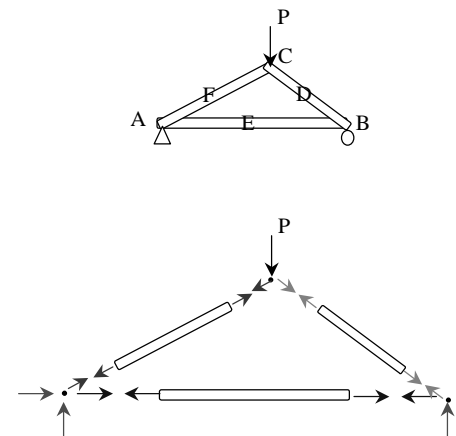
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# Method of Joints

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



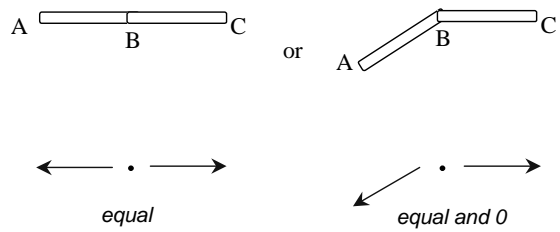
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## Joint Cases

- *two bodies connected*



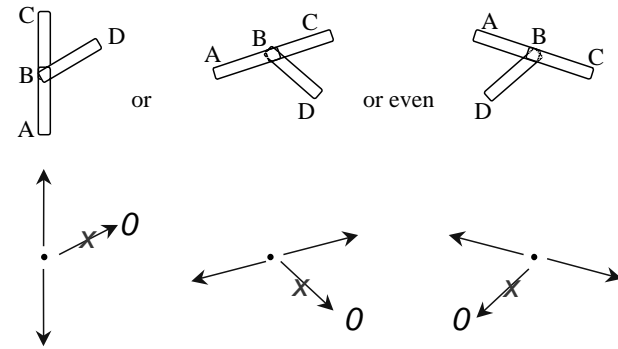
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## Joint Cases

- *three bodies with two in line*



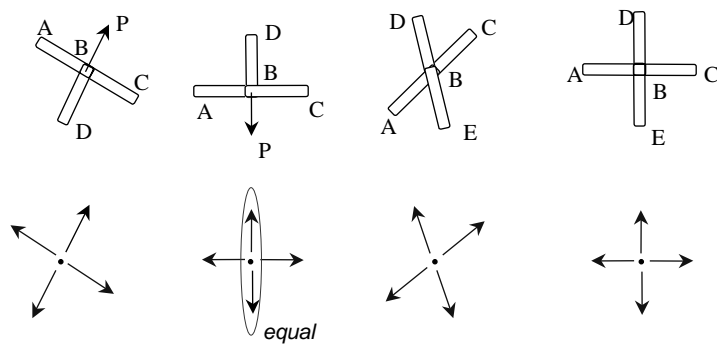
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## Joint Cases

- *crossed*



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