



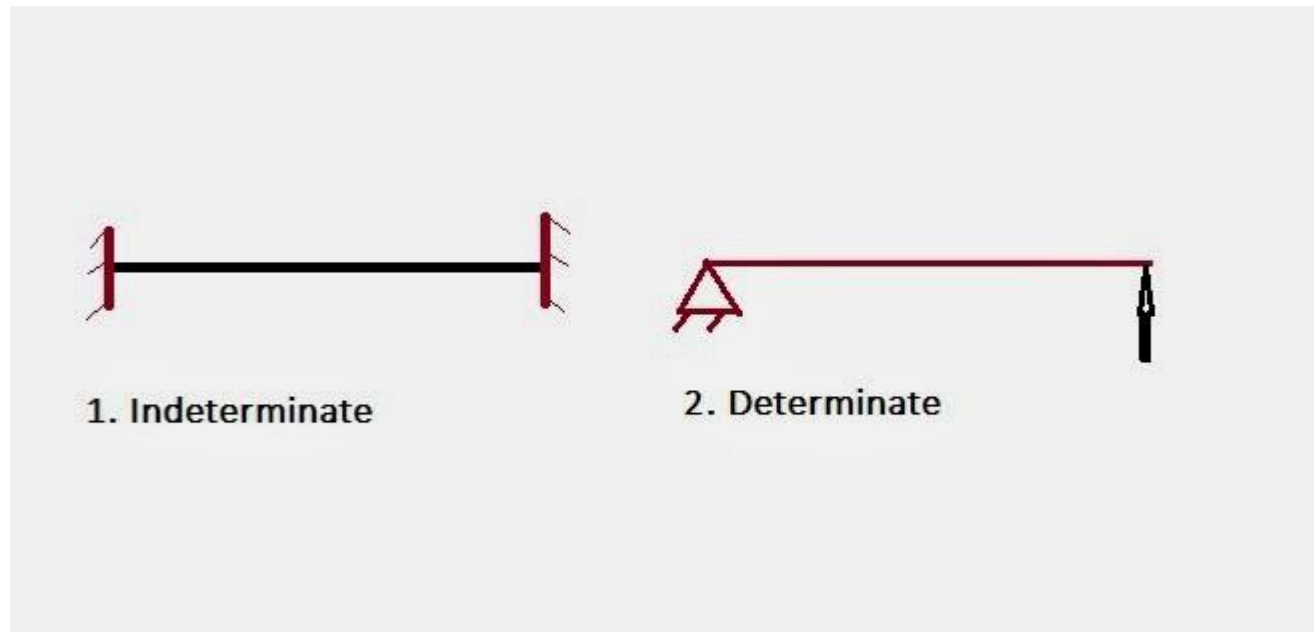
Theory of Structure

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Determinate and Indeterminate Structure

- ▶ A statically determinate structure is one that is stable and all unknown reactive forces can be determined from the equations of equilibrium alone. A statically indeterminate structure is one that is stable but contains more unknown forces than available equations of equilibrium.

Determinate and Indeterminate Structure



Support Condition

- ▶ **The beams usually have three different types of support:**
 - Hinged or pinned support.
 - Roller support.
 - Fixed support.

Roller support.

- ▶ **Roller Support:** This is **the type of support which only restrains the structure from moving in one or two perpendicular directions.** However, the structure can move in the other directions and it can also rotate. The joint that is supported by a roller support has four or five degrees of freedom.

Roller support.

- ▶ Application: The most common use of a roller support is **in a bridge**. In civil engineering, a bridge will typically contain a roller support at one end to account for vertical displacement and expansion from changes in temperature. This is required to prevent the expansion causing damage to a pinned support.



Roller support

