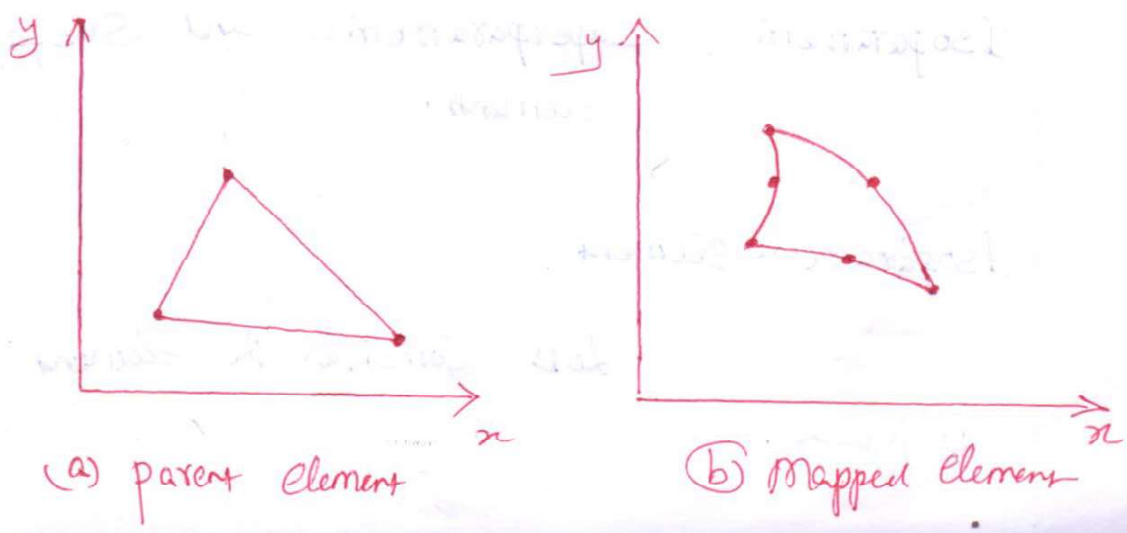
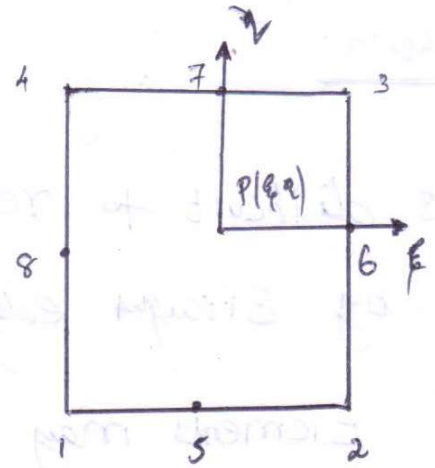
Isoparametric Formulation:

It is difficult to represent the curved boundaries by straight edges elements. A large number of elements may be used to obtain reasonable resemblance between original body and the assemblage. In order to overcome this drawback, isoparametric elements are used.

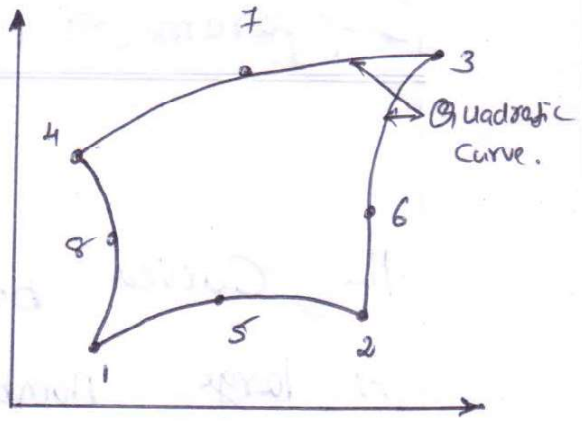
(ie) for problems involving curved boundaries, a family of elements known as "isoparametric elements" can be used.



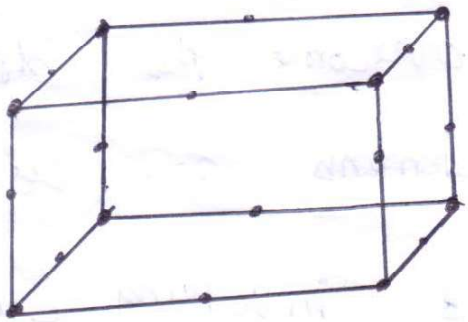
(a) parent element (b) Mapped element



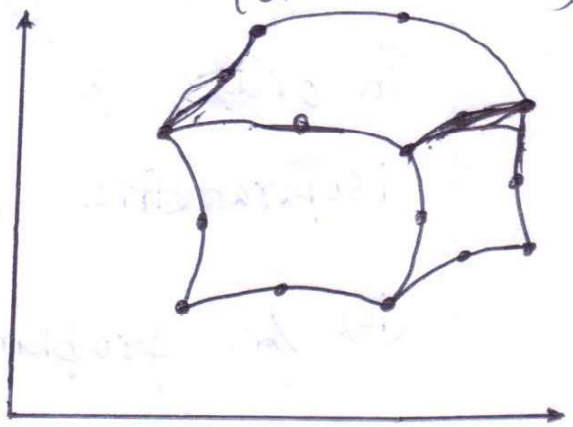
(a) Parent rectangular element



(b) Mapped rectangular element (Quadrilateral elem)



(a) Parent brick element.



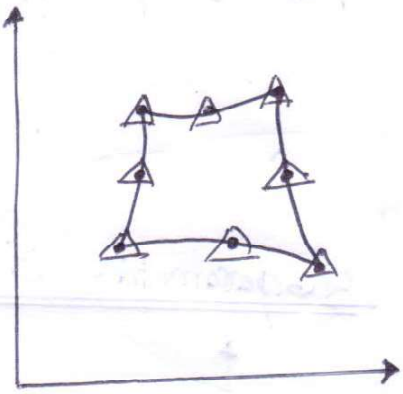
(b) Mapped brick element.

Isoparametric, Superparametric and Subparametric elements.

Isoparametric element

Let's consider the element shown in figure.

⇒ • Nodes used to define geometry
△ " " define displacement.

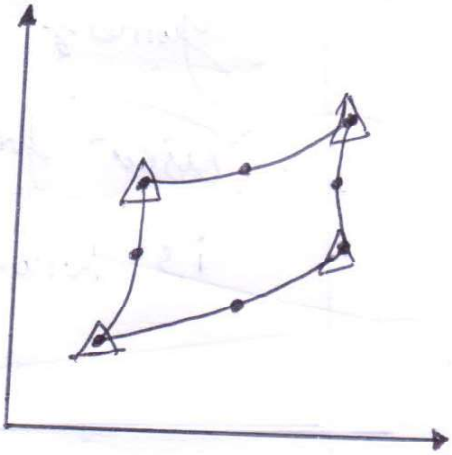


⇒ In this element, all the eight nodes are nodes are used in defining geometry as well as displacements.

⇒ If the number of nodes used for defining the geometry is same as no. of nodes used for defining the displacements then it is known as. isoparametric element.

Super Parametric Element.

• Nodes used for defining geometry
△ Nodes used for defining displacements.

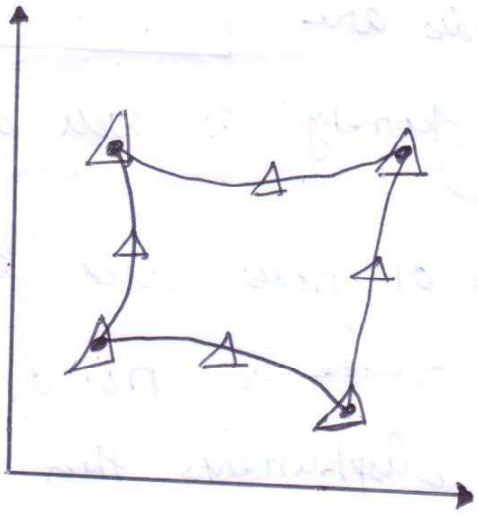


⇒ Here eight nodes used to define the geometry and four nodes are used to define the displacements.

⇒ If the no. of nodes used for defining the geometry is more then number of nodes used for defing

the displacements, then known as Super parametric elements.

Subparametric Elements:



⇒ • Nodes used for defining Geomen.

⇒ Δ Nodes used for defn. displacement.

⇒ Four nodes are used to define the geometry and Eight nodes are used to define the displacements.

⇒ If the no. of nodes used to defining the Geometry is less than number of nodes used for defining the displacements, then it is known as Sup parametric elements.