**Introduction to CAD**

**Design Process**
- Idea
- Capture on paper
- Communicate idea (engineering drawing)
- Manufacture idea

- CAD is the most significant technology for product design

**Sketch Idea**

**Drafting**
- Pencils
- Table
- Tools

**Drafting - 2D**

**Drafting with 3D**
CAD Highlights

- 1962 - Ivan Sutherland (MIT)
  - 1963 Ph.D Thesis
    - "Sketchpad, a Man Machine Graphical Communication System"
- 1982 – AutoCAD
- 1985 – Pro/E
- 1993 – SolidWorks

- Others: SolidEdge, Catia, Inventor, TurboCAD, Unigraphics, and many more
Advantages of CAD

- Quality
- Revisions
- Speed
- Information database
- Enables analysis

CAD System Configuration

- CPU
- Memory
- Graphics card
- Hard disk (storage)
- Monitor

CAD Software

- 2D (AutoCAD, Cadkey)
- 3D – wireframe (Cadkey)
- Solids-modeler (Pro/E, CATIA, Solidworks)

Solids Modeling

Solids versus 2D

The 3-Pinned Ellipt - A Non-realizable Object

Solids versus 2D
Parametric Design

Figure 38.5: An example of parametric design. Dimensions of part features can be modified easily to quickly obtain an updated solid model.

Solid Modeling Benefits

- Correct geometry
- Better visual models
- Hidden line removal
- Sharing of geometry
- Product marketing
- Rapid prototyping
- Mass properties
- Computer Aided E

Demo

- Pro/E assignment
- SolidWorks car
- Solidwork assembly