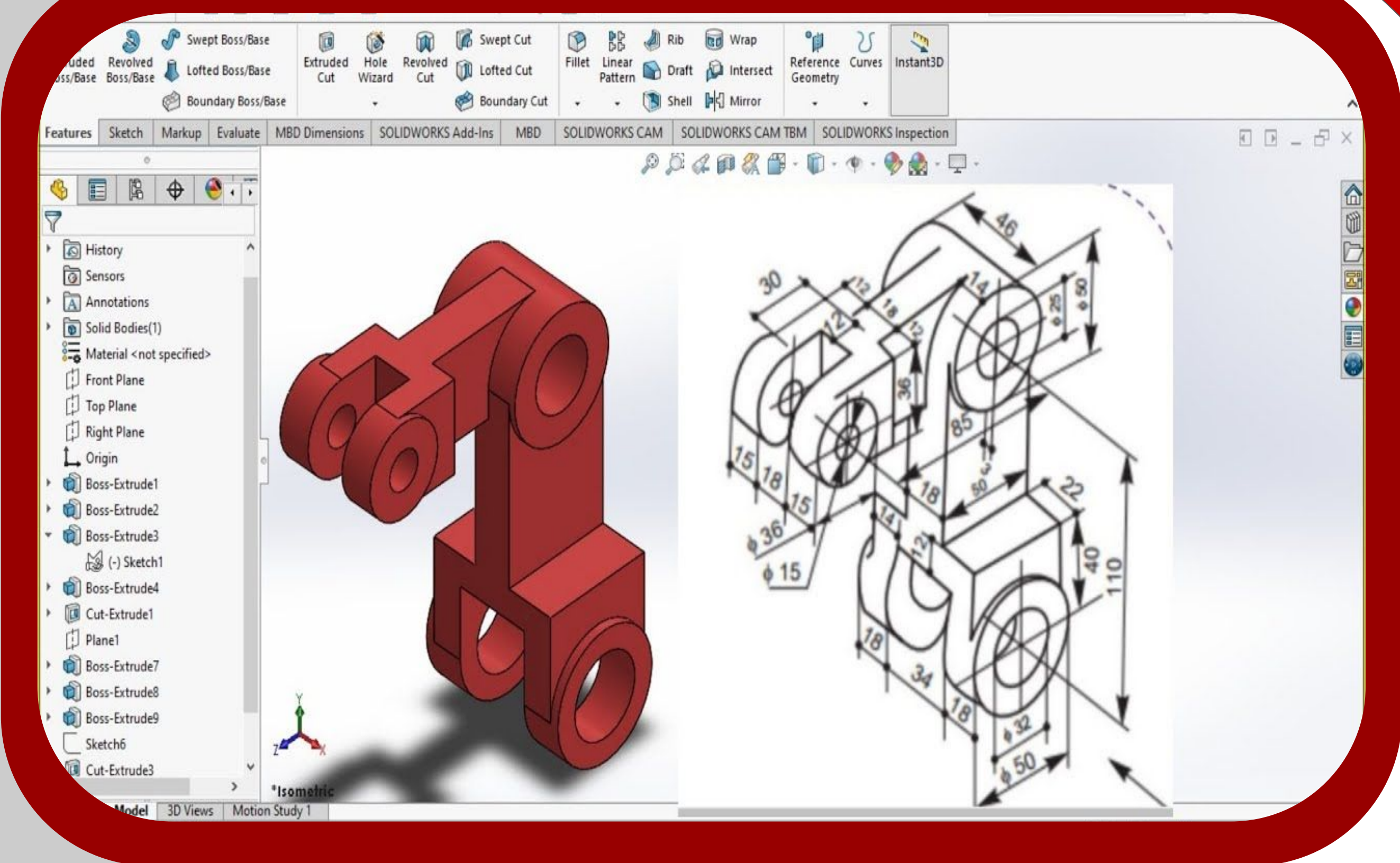


Introduction to SolidWorks



Sketching

- **Line / Centerline** – Draw straight lines; centerlines are reference-only
- **Circle (Centerpoint, Perimeter)** – Create circular shapes
- **Rectangle (Corner, Center)** – Draw rectangles
- **Arc (3-point, tangent, centerpoint)** – Create curved segments
- **Spline** – Freeform curves
- **Ellipse / Slot / Polygon** – Special shapes
- **Trim / Extend** – Cut or lengthen sketch entities
- **Offset Entities** – Copy geometry at a distance
- **Convert Entities** – Project edges into sketch
- **Mirror Entities** – Reflect sketch geometry
- **Linear / Circular Pattern (Sketch)** – Repeat shapes
- **Smart Dimension** – Add dimensions
- **Relations (Coincident, Parallel, etc.)** – Control geometry behavior



Extruding/Cutting

- **Extruded Boss/Base** – Extend a sketch into 3D
- **Revolved Boss/Base** – Spin a sketch around an axis
- **Swept Boss/Base** – Move a profile along a path
- **Lofted Boss/Base** – Blend between multiple profiles
- **Boundary Boss/Base** – Advanced loft with better control

Advanced Features

- Fillet** – Round edges
- Chamfer** – Bevel edges
- Shell** – Hollow out a part
- Draft** – Add taper (for molding)
- Rib** – Thin support walls
- Wrap** – Project sketch onto curved surface
- Flex** – Bend, twist, taper models
- Scale** – Resize bodies

Advanced Mates

- **Limit Mate** → restrict movement range
- **Symmetric** → keep centered
- **Width Mate** → auto-center part

Mechanical Mates

- **Hinge** → rotation like a door
- **Gear** → linked rotation
- **Screw** → rotation + linear motion

1. WHAT IS AN ASSEMBLY?

A collection of parts put together to form a complete product

- Combines multiple parts (.SLDPRT)
- Saved as an assembly file (.SLDASM)
- Defines how parts fit and move together

5. ASSEMBLY FEATURES

Modify parts within the assembly

- **Assembly Cut** → cuts across multiple parts
- **Hole Series** → aligned holes through parts

2. CORE TOOLS

The essentials you use most

Insert Components

- Add parts into the assembly
- First part is usually *fixed*

Move / Rotate Component

- Drag parts freely before constraining

Mate (MOST IMPORTANT ★)

- Defines how parts connect

6. ORGANIZATION TOOLS

Keep assemblies clean and manageable

- **Subassemblies** → group parts together
- **Folders** → organize feature tree
- **Configurations** → different versions of assembly

3. MATES (HOW PARTS CONNECT)

Controls position and movement

Standard Mates

- **Coincident** → faces touch
- **Parallel** → stay aligned
- **Perpendicular** → 90° relationship
- **Distance** → fixed spacing
- **Angle** → set rotation

7. MOTION & MECHANISM

Make your assembly move

- Drag components with mates applied
- **Motion Study** (simulate movement)
- **Detect collisions**

4. PATTERNS & MIRRORS

Quickly duplicate components

- **Linear Component Pattern**
- **Circular Component Pattern**
- **Mirror Components**

8. ANALYSIS TOOLS

Check if your design works

- **Interference Detection** → find overlapping parts
- **Clearance Verification** → check spacing
- **Mass Properties** → weight, center of mass

