EN1740 Computer Aided Visualization and Design

Spring 2012

2/9/2012 (Make-up for 2/7/12)

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Last Time:

- More solid modeling tools
  - Hole
  - Round
  - Chamfer
  - Pattern
- Model some parts
- Pro/Engineer survival tips
- Review of individual project proposals

Tonight:

- How to measure parts
  - *Please measure parts for projects*
- Introduction to part modeling *Best Practices*
- Model some parts
  - In class exercises including
    - Extrude
    - Revolve
    - Hole
    - Round
    - Chamfer
    - Pattern

Measurement equipment – Need this for project

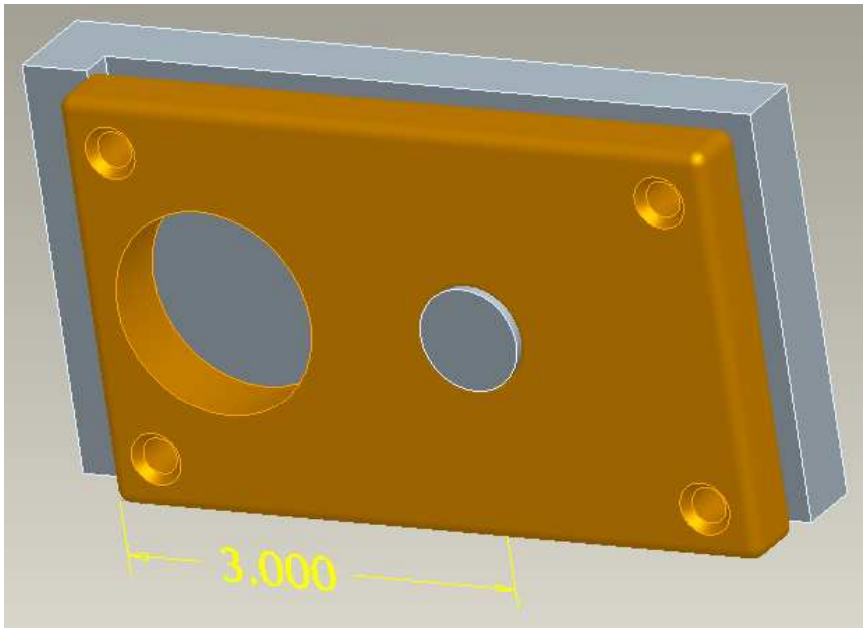
Micrometer

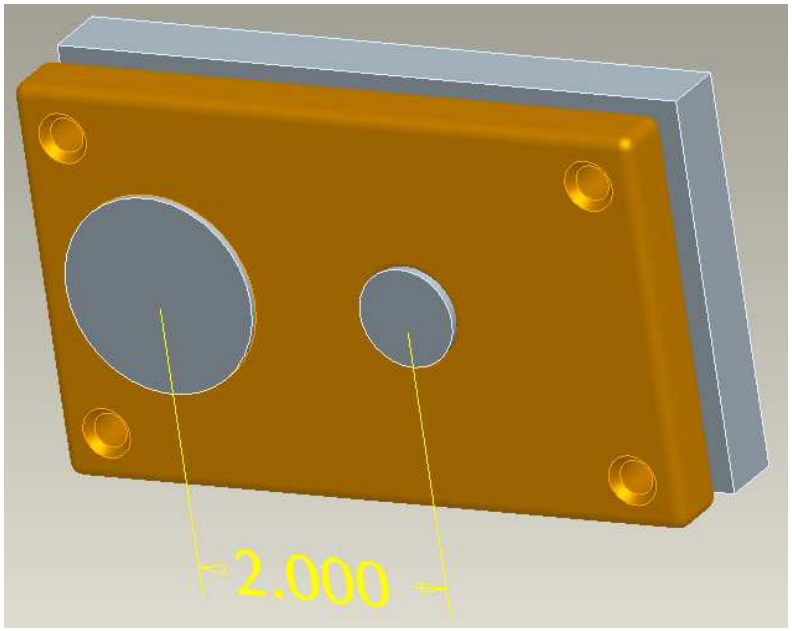
Dial Caliper

Introduction to part modeling *Best Practices*

- Dimension and Constrain to capture **Design Intent**
- One part feature <=> one model feature
    - Don’t try to get all the details into one feature
- Functional features first, cosmetic features second
    - Rounds, chamfers, text, etc. should always be last in a model tree
- Understand **Parent-Child** relations and be careful how the model is constructed

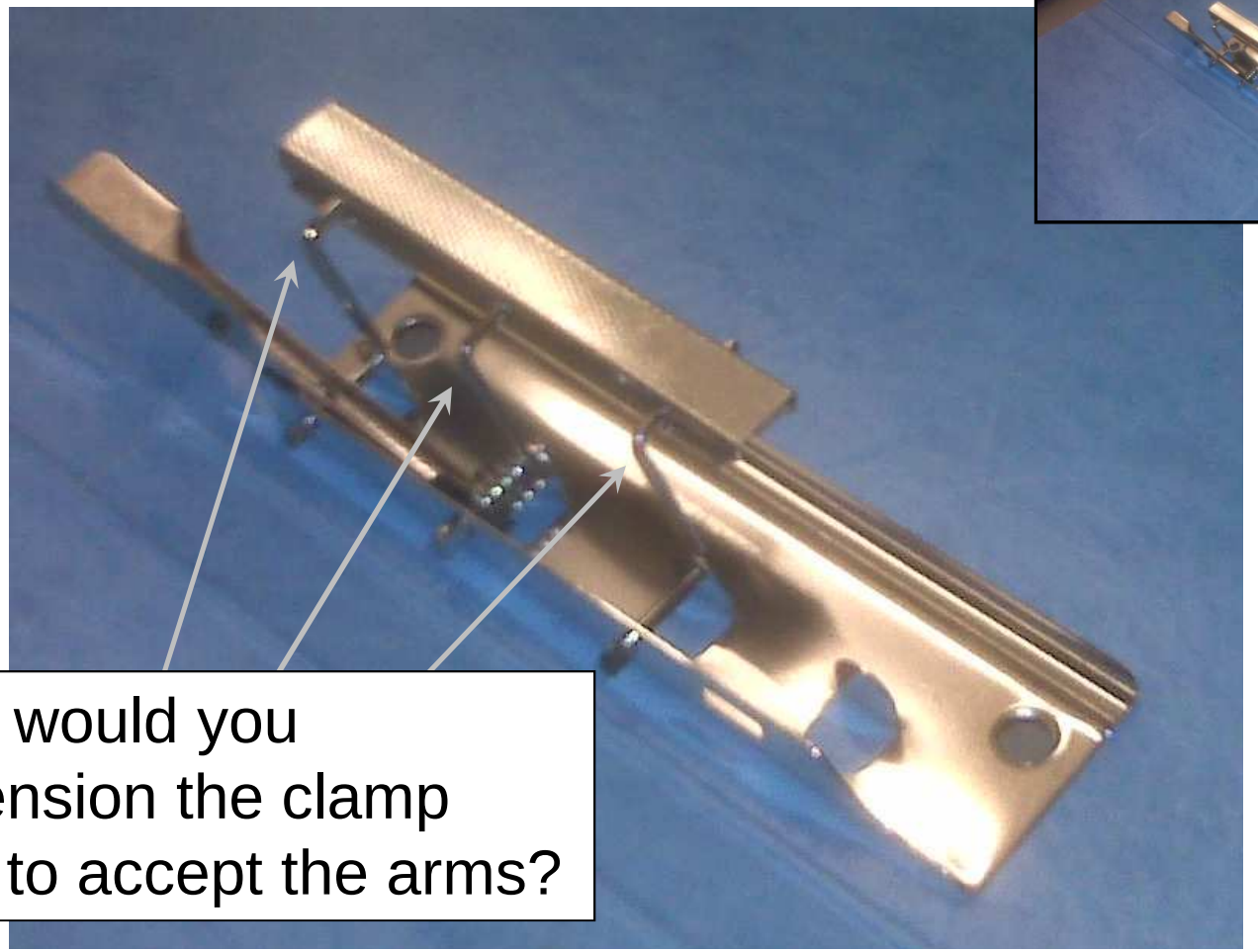
Design Intent





Models that correctly capture Design Intent convey the intended ***function*** of the components being modeled.

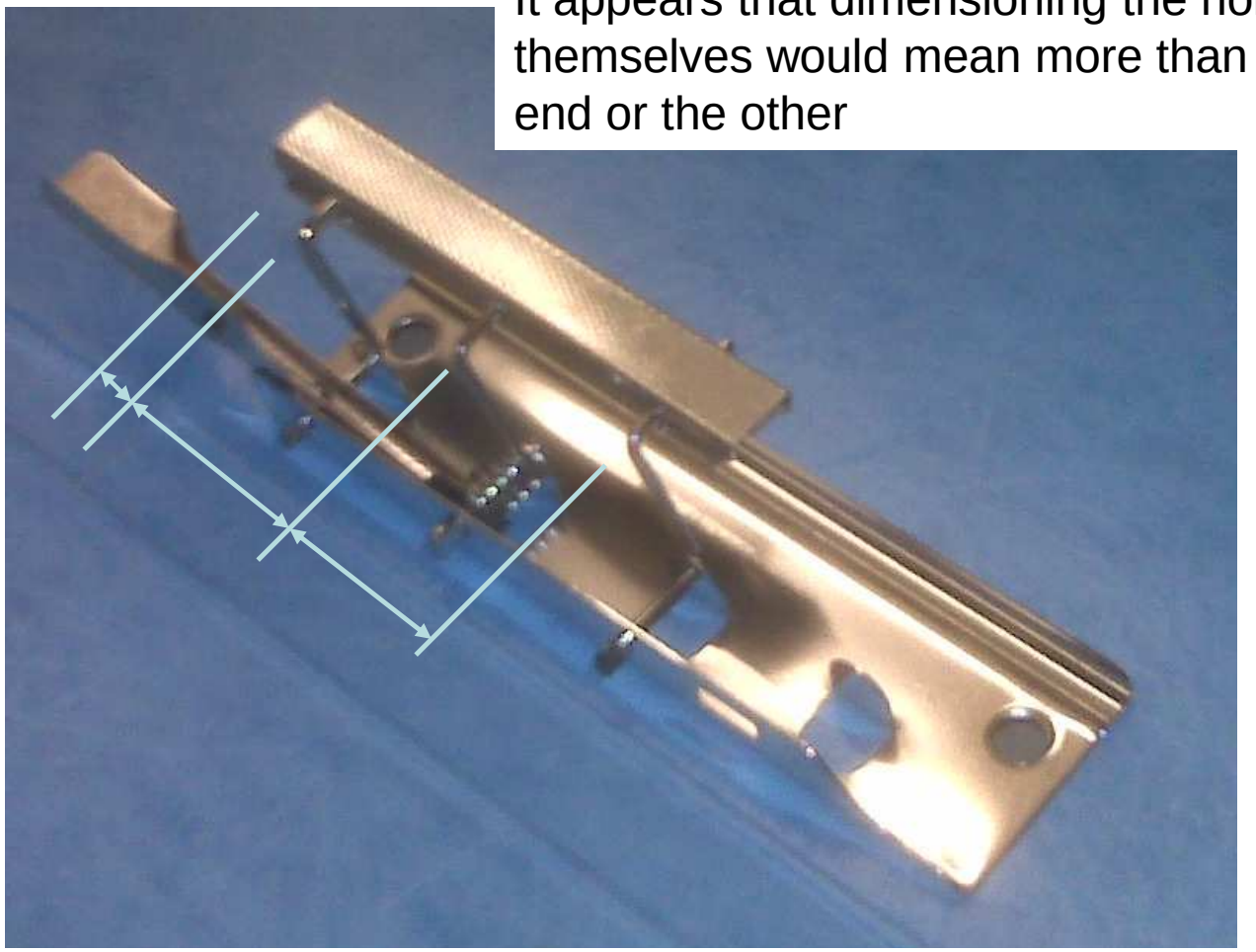
Design Intent



How would you dimension the clamp face to accept the arms?

Design Intent

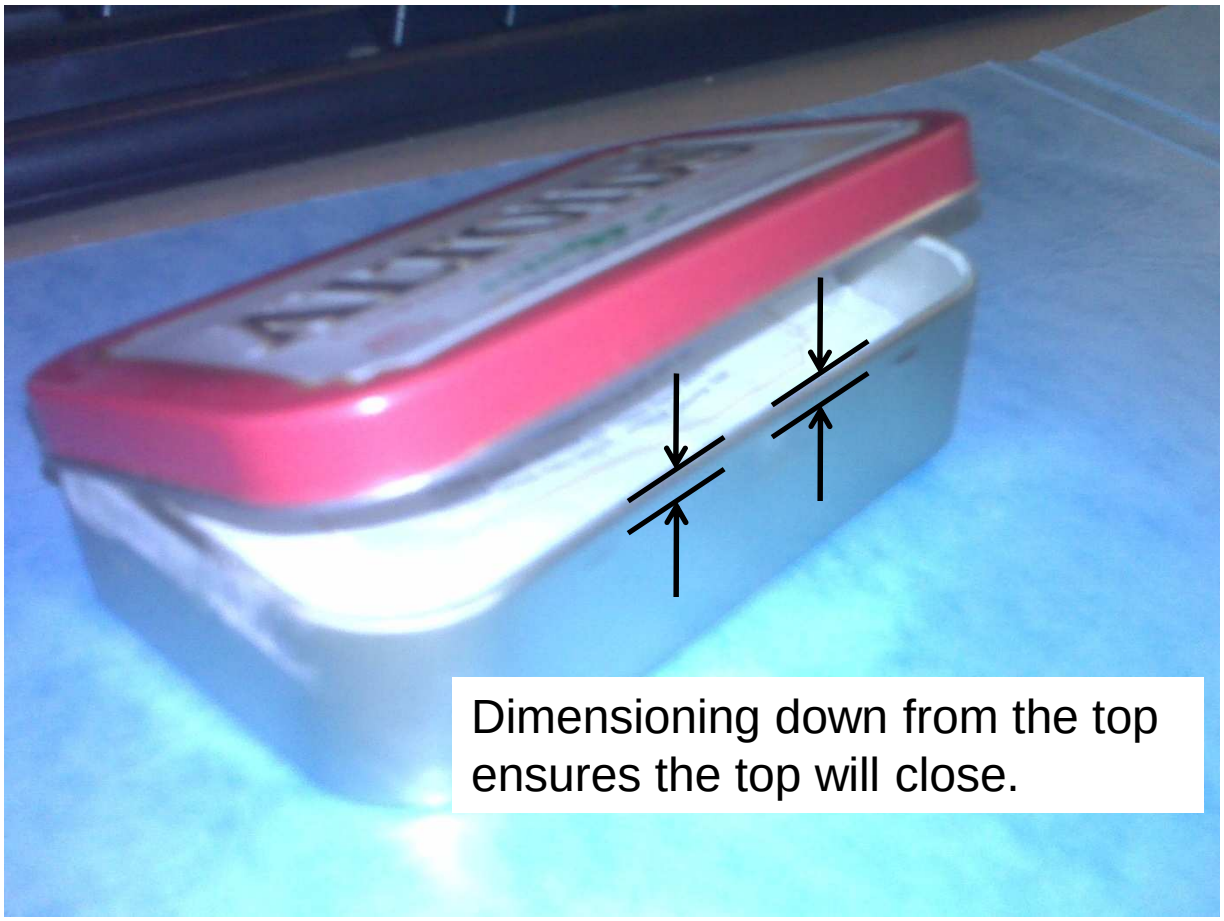
It appears that dimensioning the holes to themselves would mean more than from one end or the other



Design Intent

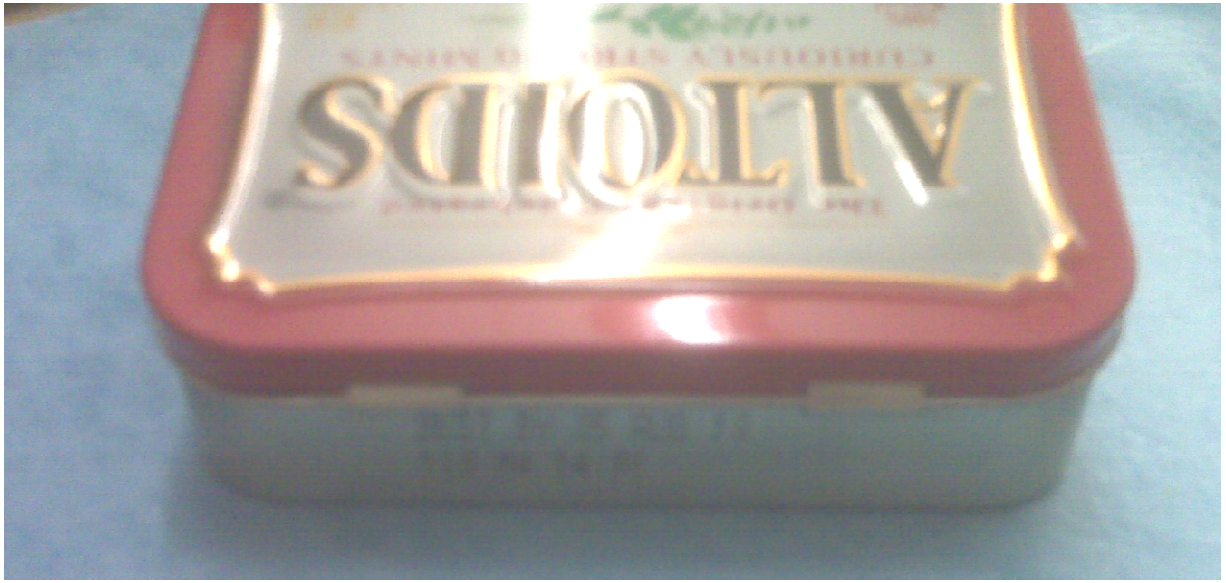
How should these latch stampings be dimensioned?

Design Intent



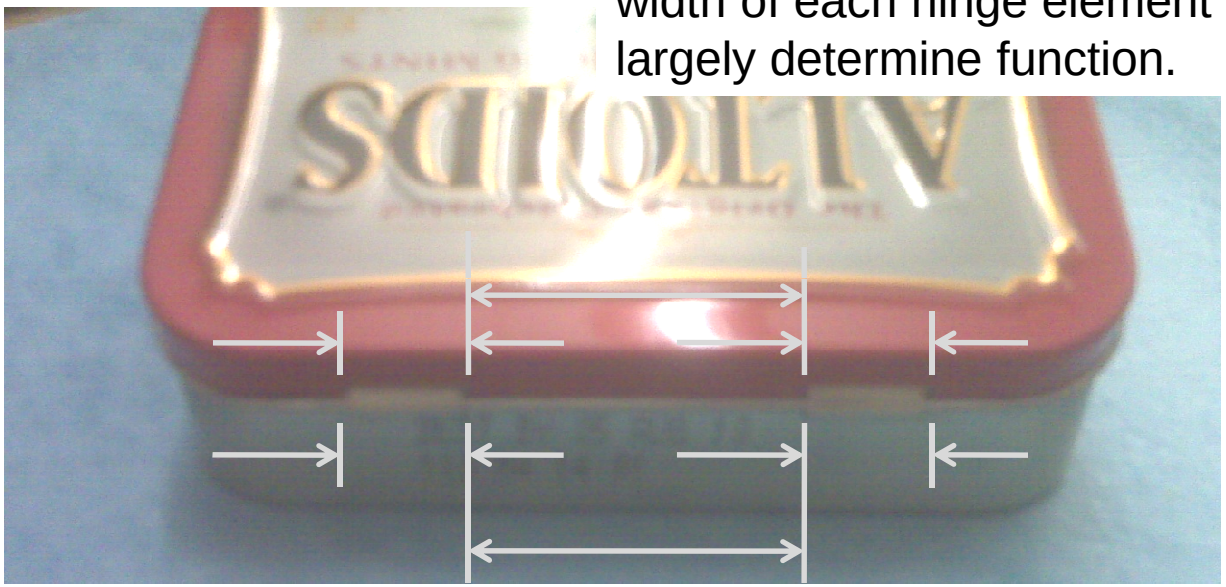
Design Intent

What relationships need to be maintained to get the hinges to function properly?



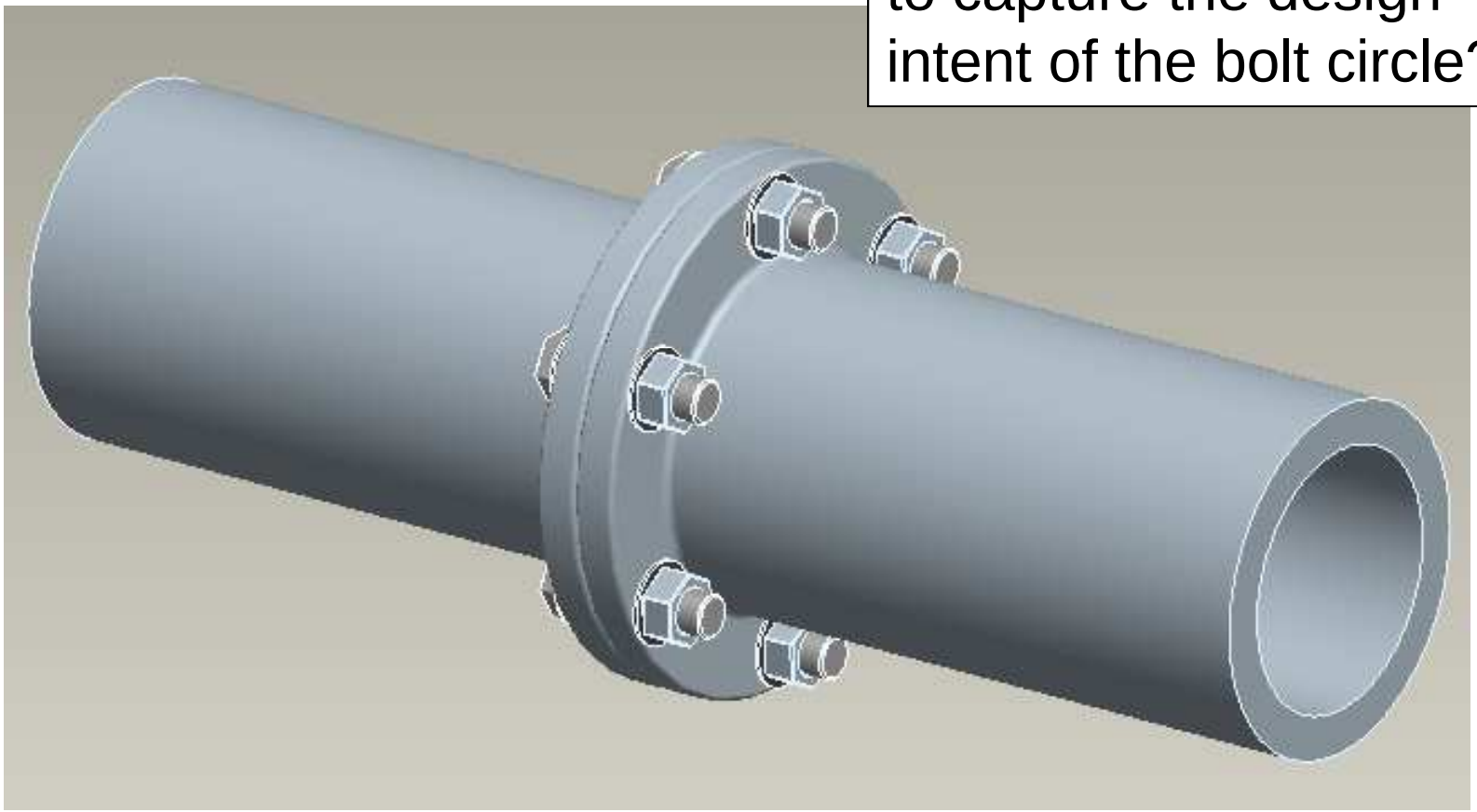
Design Intent

Location between hinges and width of each hinge element largely determine function.

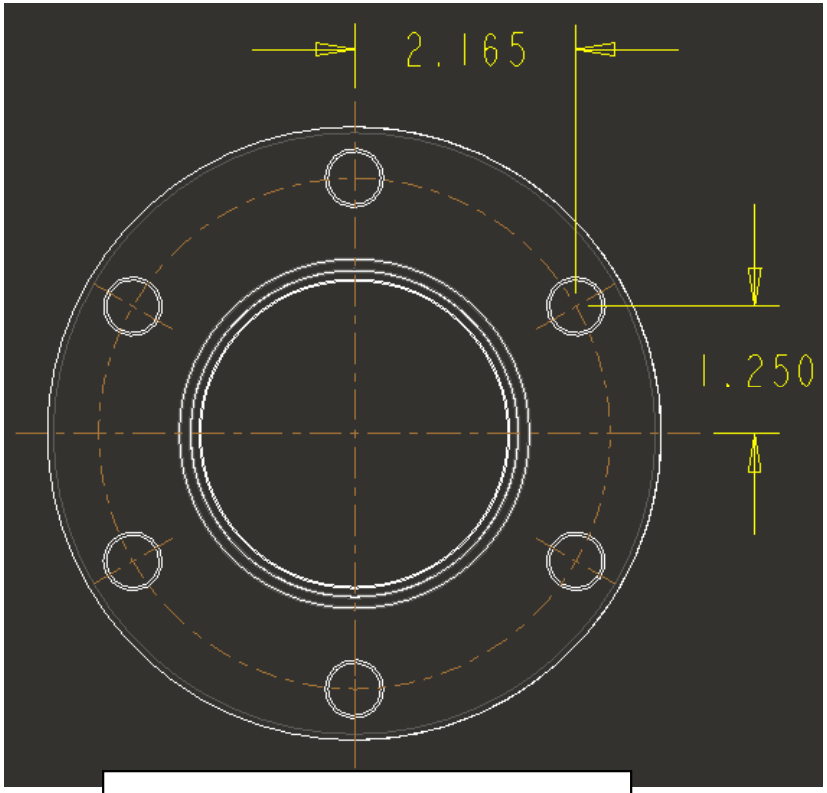


Design Intent

What is the correct way to capture the design intent of the bolt circle?

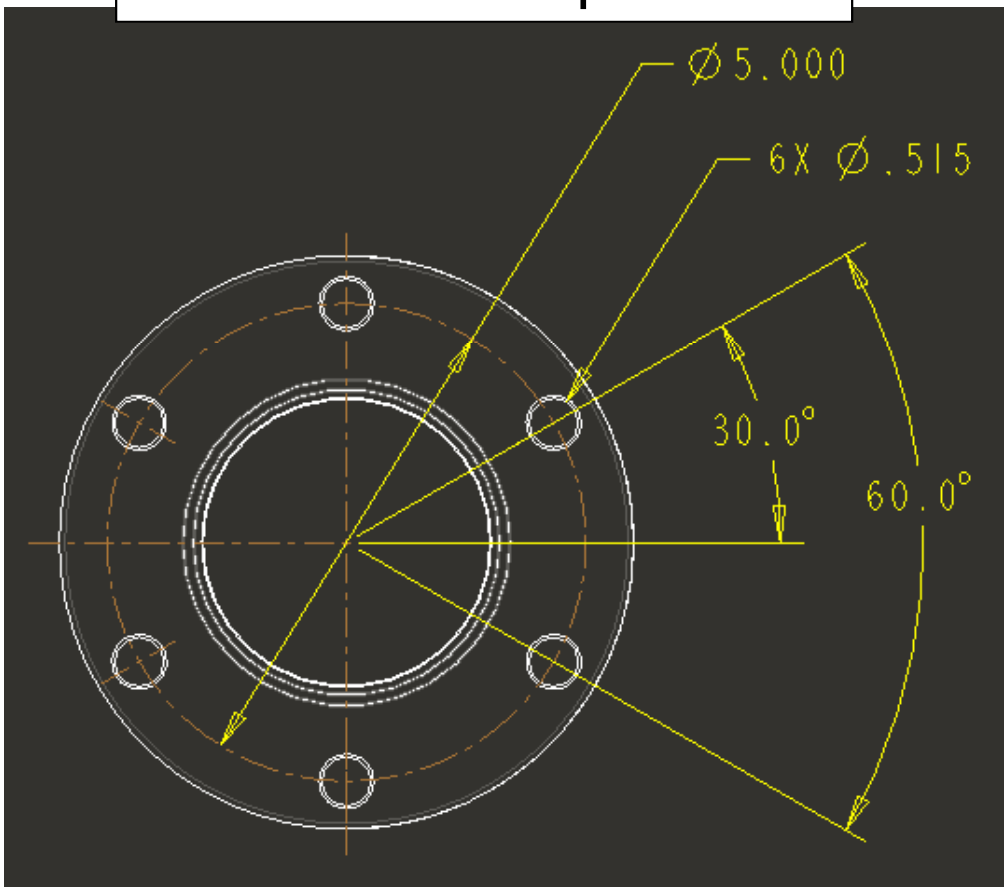


Design Intent

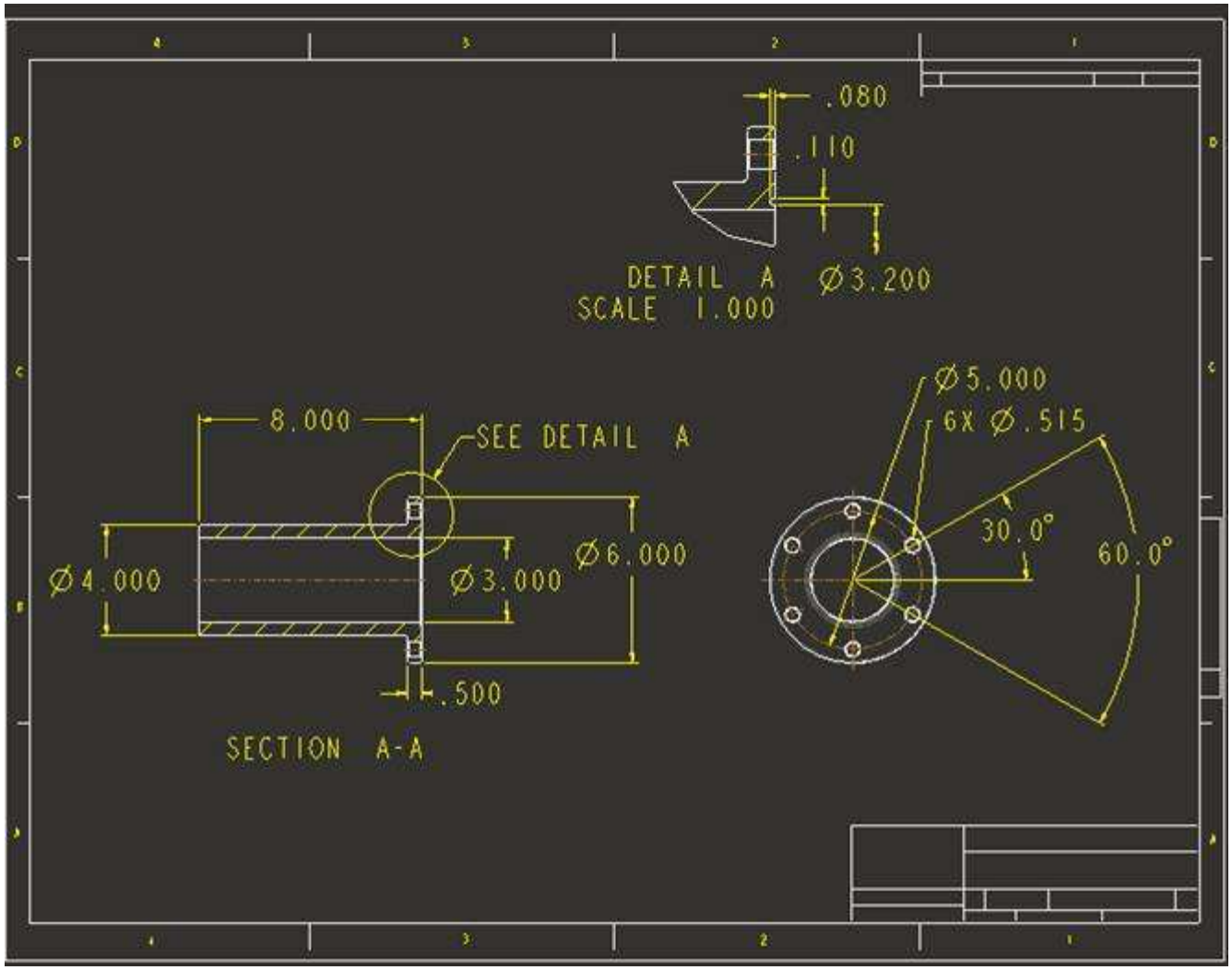


Does this seem appropriate?

More closely represents function of part.



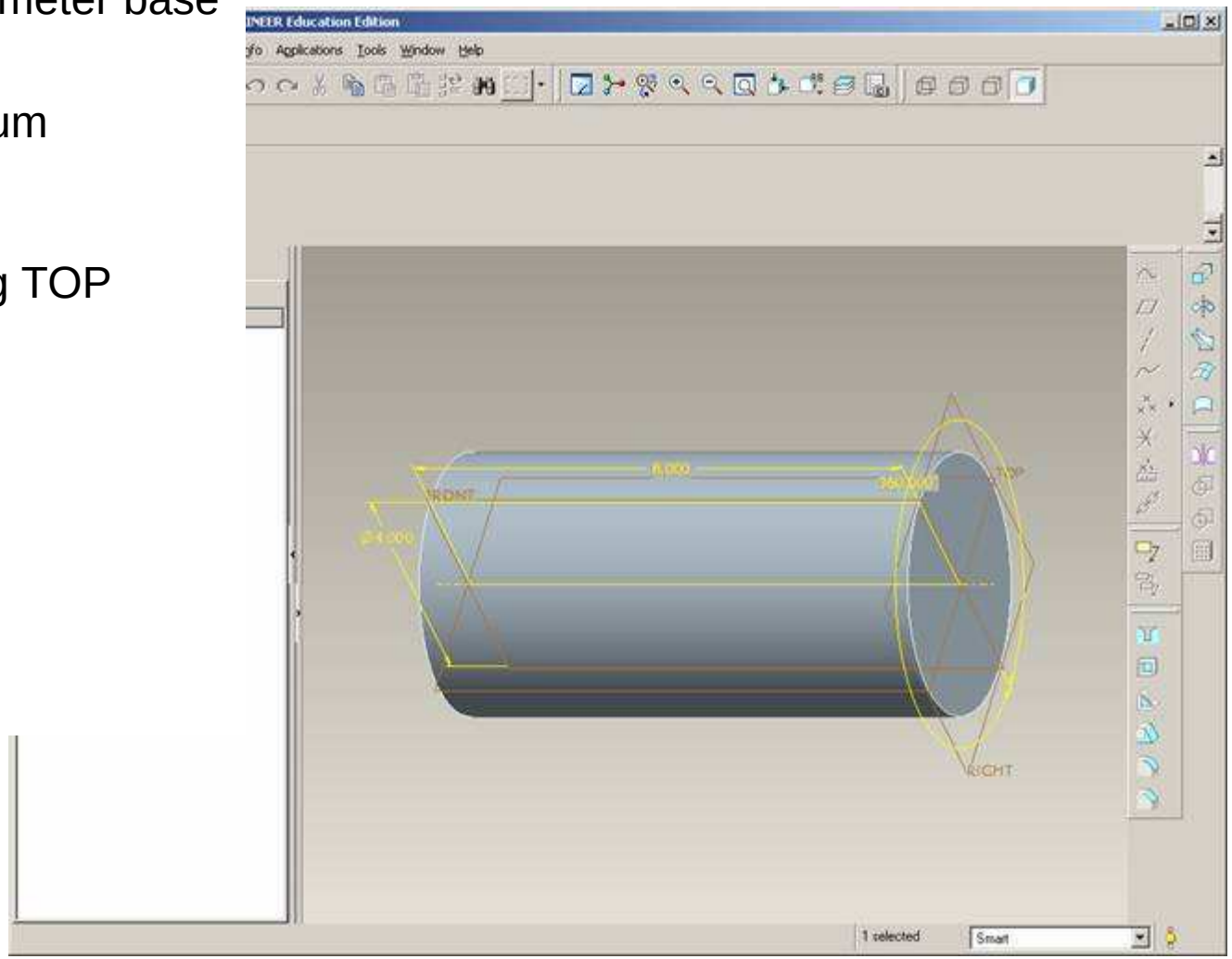
EXERCISE – Create pipe flange



EXERCISE – Create pipe flange

Create a ϕ4in. X 8in. diameter base feature

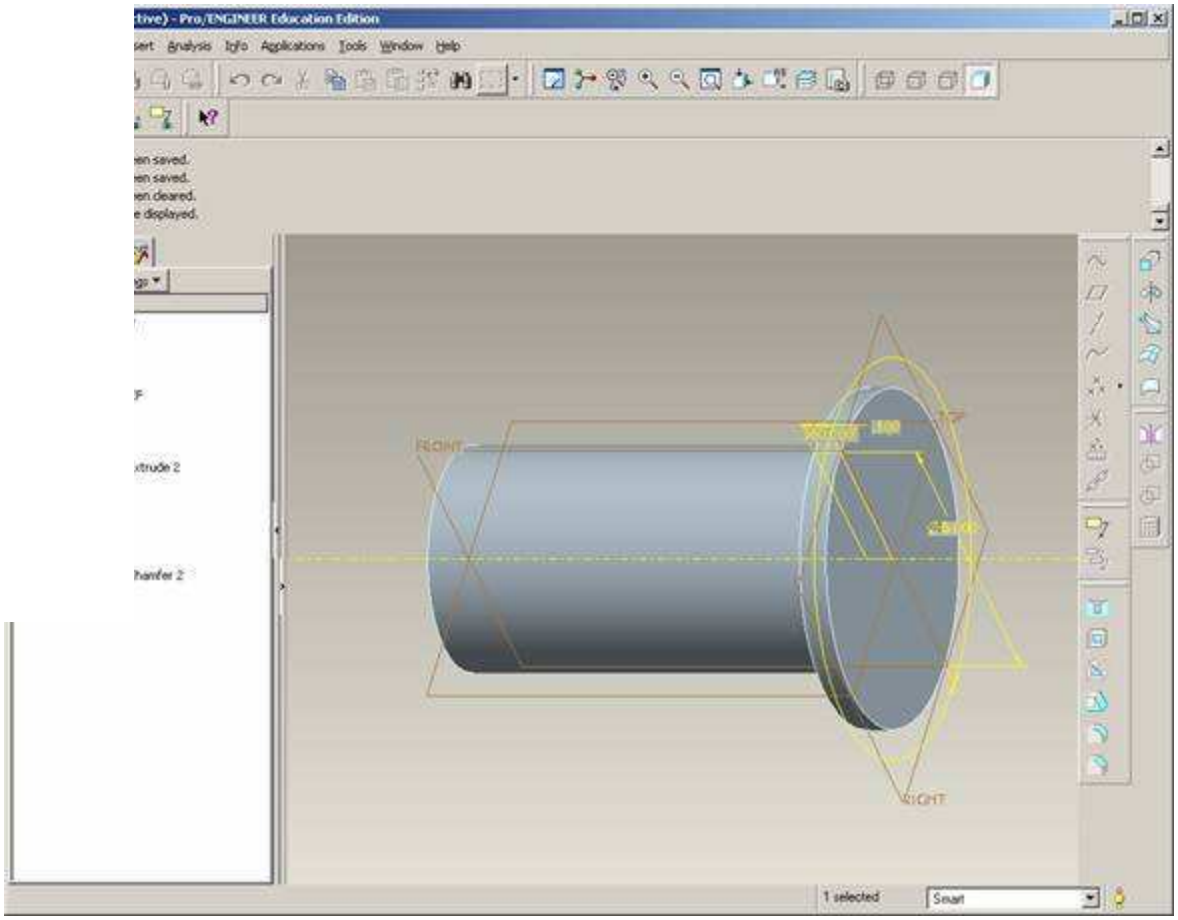
- Sketch on FRONT datum
- Use default reference
- Create centerline along TOP datum
- Sketch a rectangle
- Dimension
- Complete sketch
- Revolve 360deg.



EXERCISE – Create pipe flange

Create a ϕ6in. X .500in. flange feature

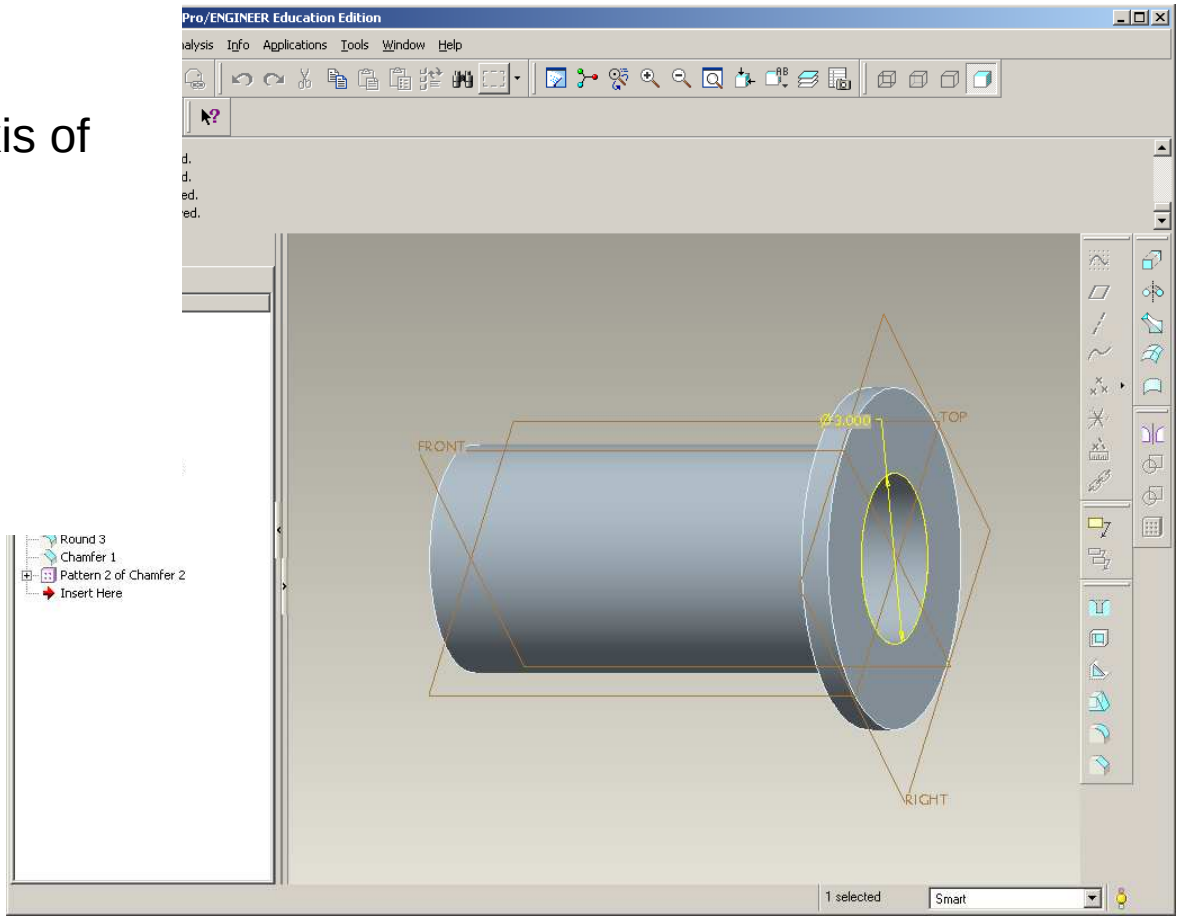
- Sketch > Use Previous
- Create centerline along TOP datum
- Sketch a rectangle
- Dimension
- Complete sketch
- Revolve 360deg.



EXERCISE – Create pipe flange

Create a ϕ3in. hole through everything

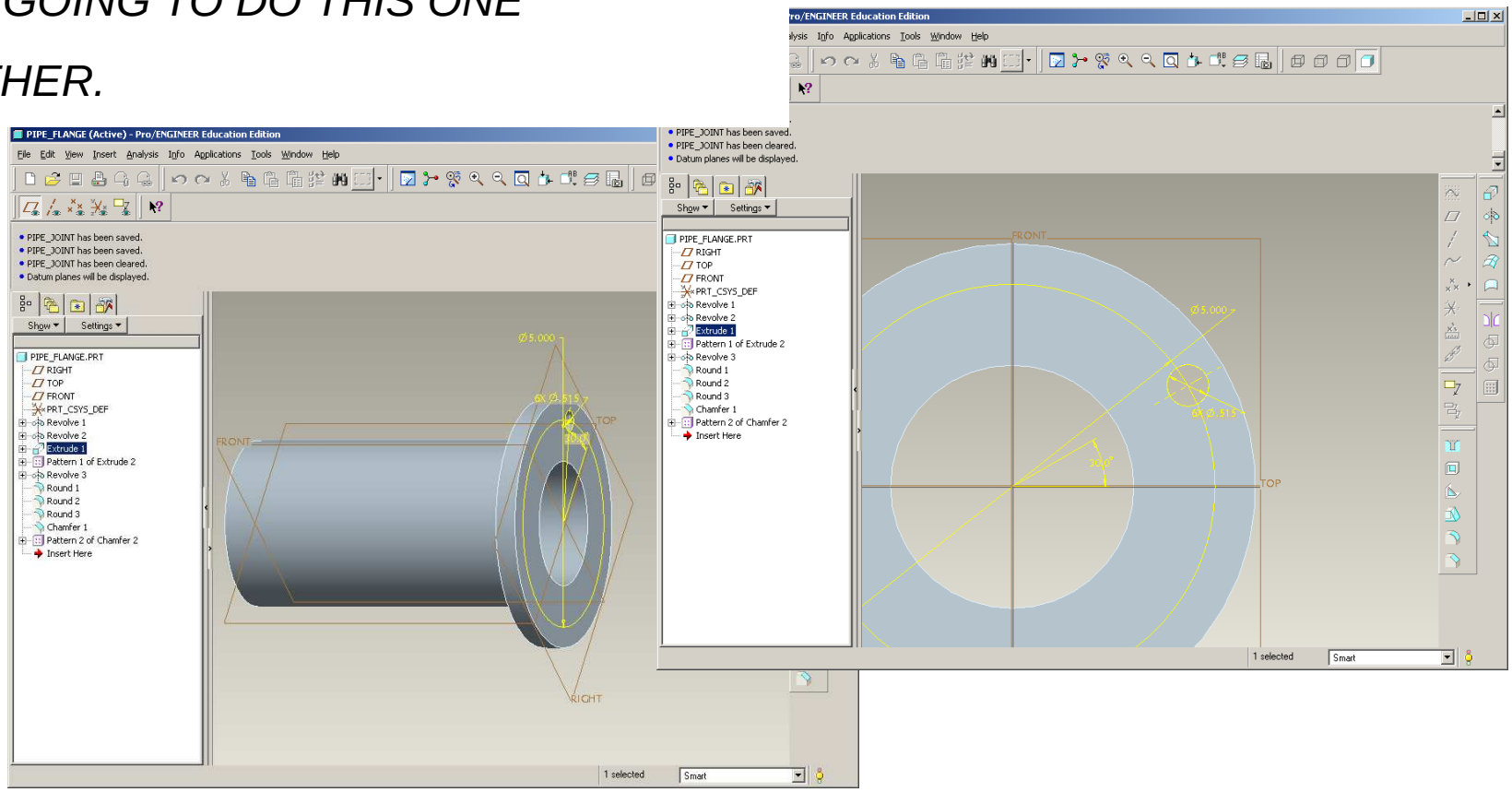
- Sketch on RIGHT datum
- Sketch circle aligned with axis of part
- Dimensions
- Complete Sketch
- Extrude > Through All



EXERCISE – Create pipe flange

Create the first through hole for the bolt circle

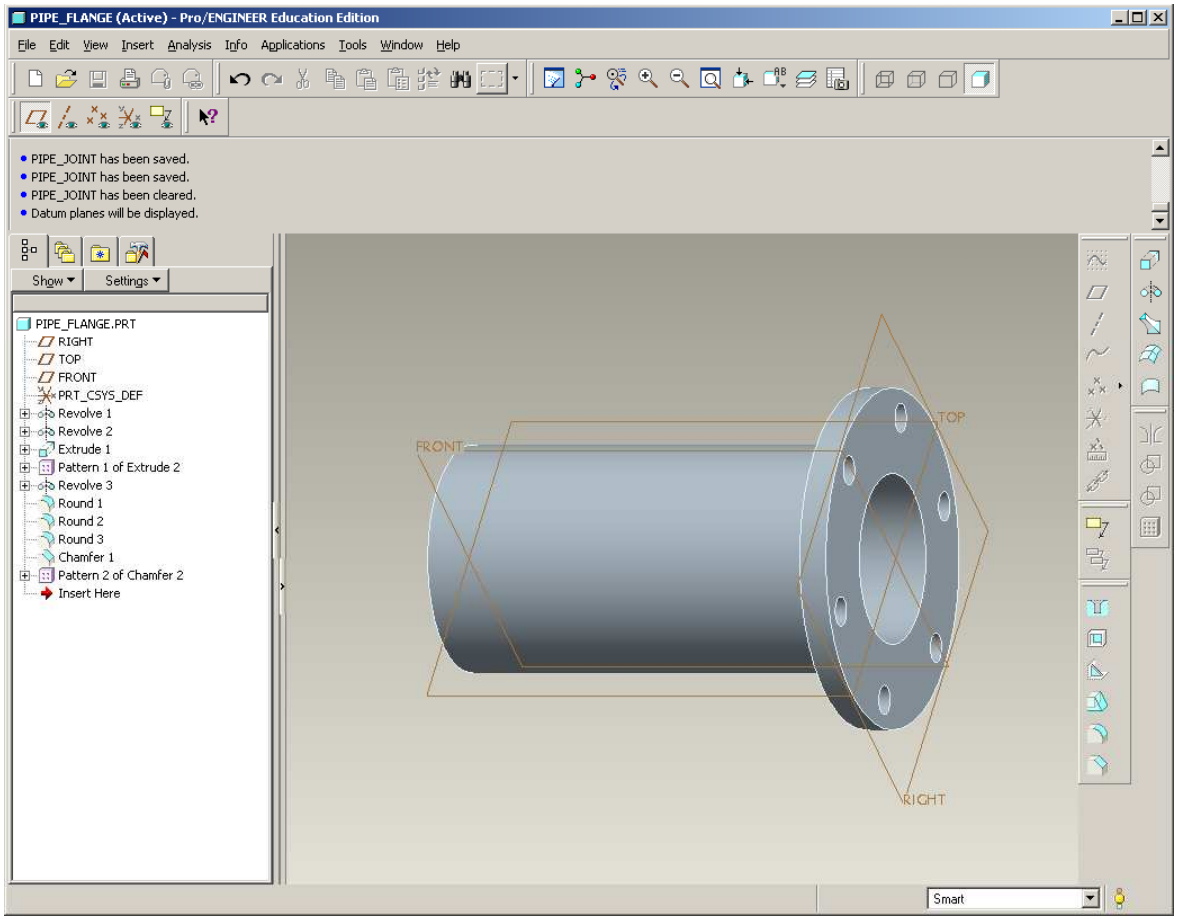
- *LET ME KNOW WHEN YOU GET HERE, WE'RE GOING TO DO THIS ONE TOGETHER.*



EXERCISE – Create pipe flange

Pattern ϕ.515in. hole

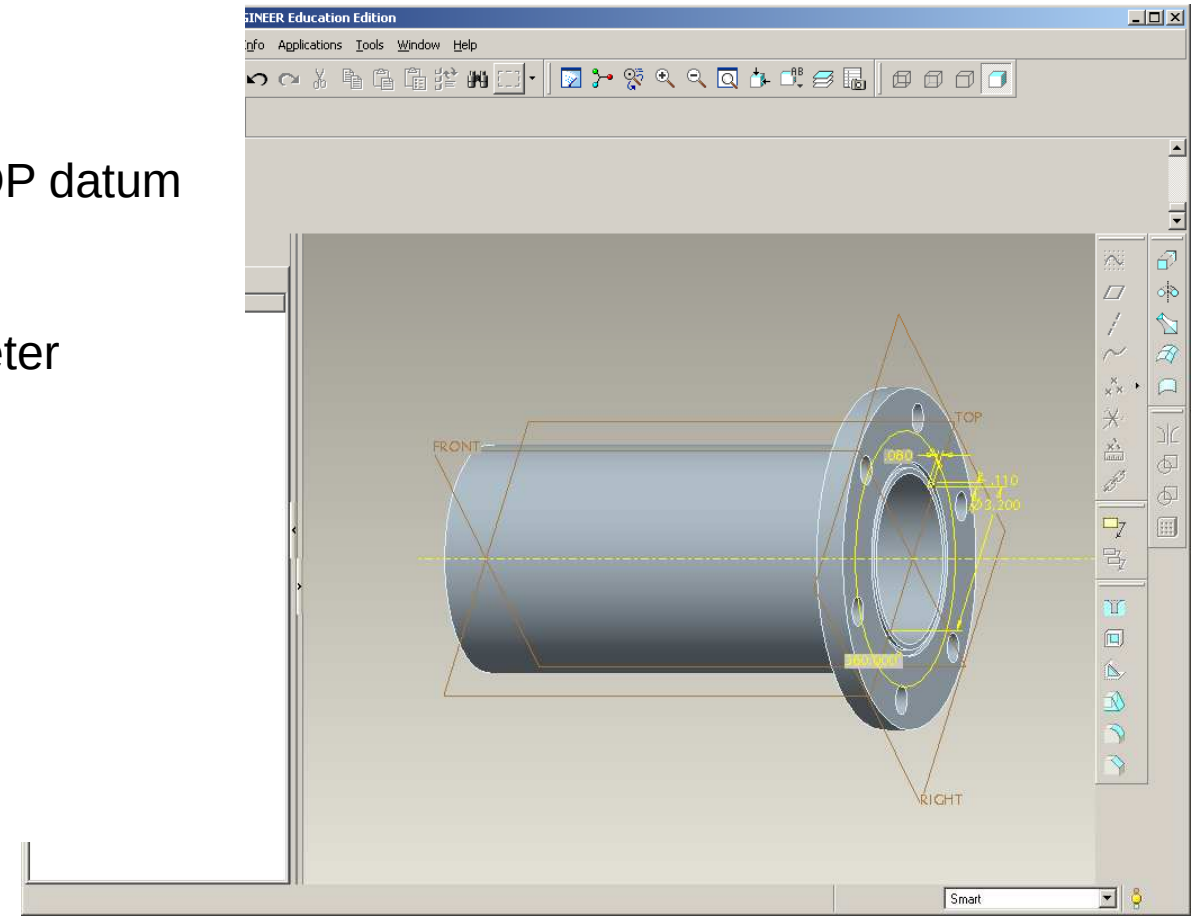
- 6X ϕ.515in. X 60deg



EXERCISE – Create pipe flange

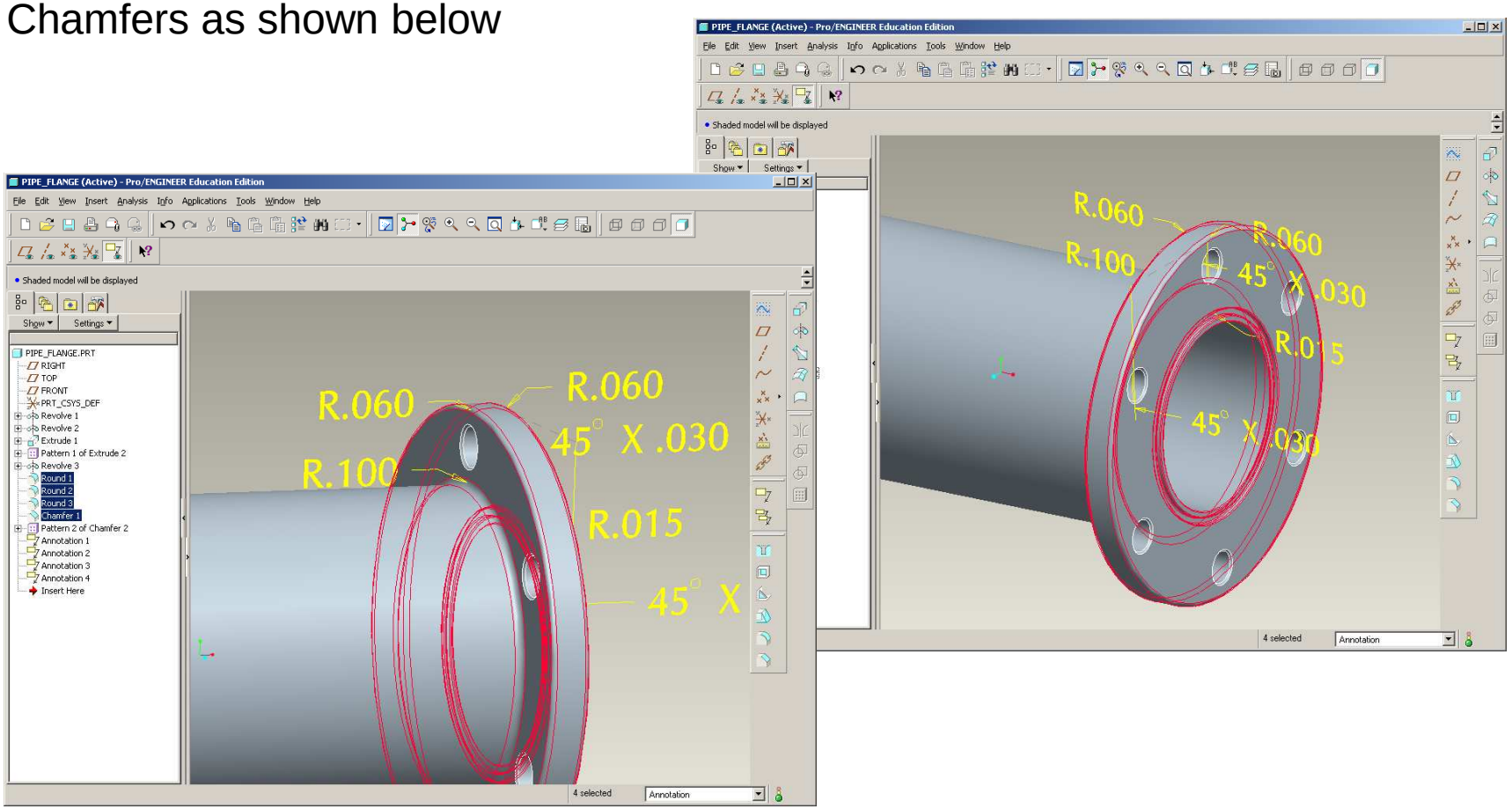
Create an o-ring groove

- Sketch on FRONT datum
- Use default reference
- Create centerline along TOP datum
- Sketch a rectangle
  - ϕ3.200in. inside diameter
  - .110in. width
  - .080in. deep
- Dimension
- Complete sketch
- Revolve 360deg.



EXERCISE – Create pipe flange

Create Rounds and
Chamfers as shown below



EXERCISE – Create pipe flange

Create Chamfers on through-holes using a *REFERENCE PATTERN*