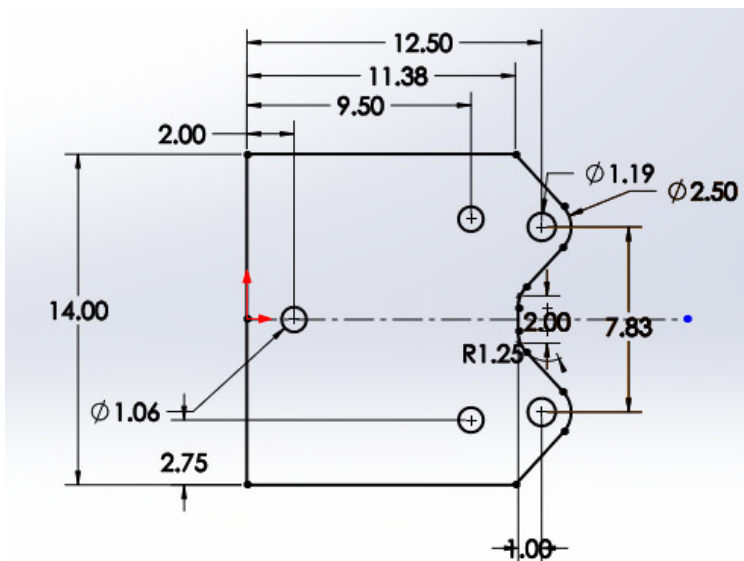
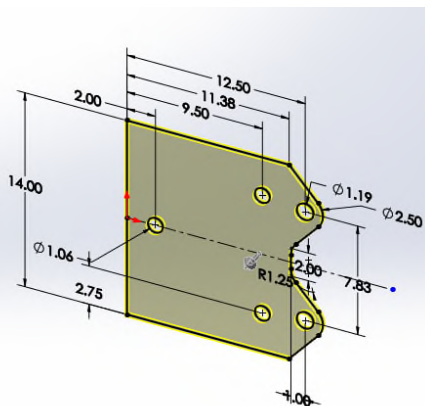
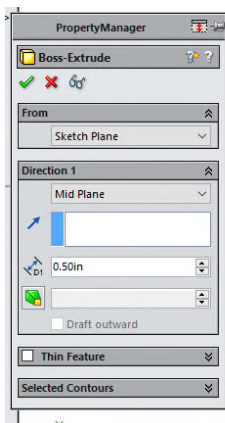


## Chapter 2: Geometric Construction Tools

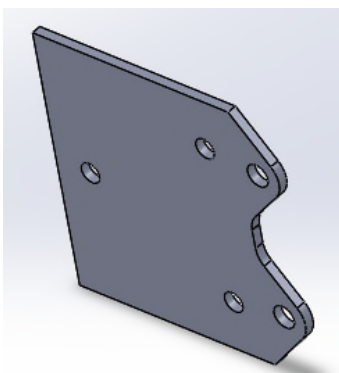
### 1. Problem 2-1



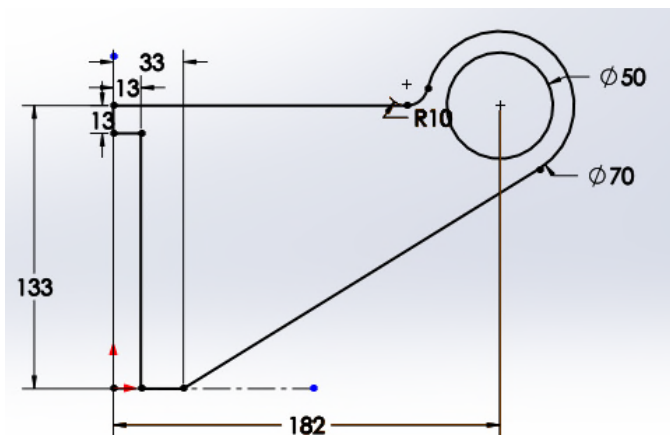
Step 1



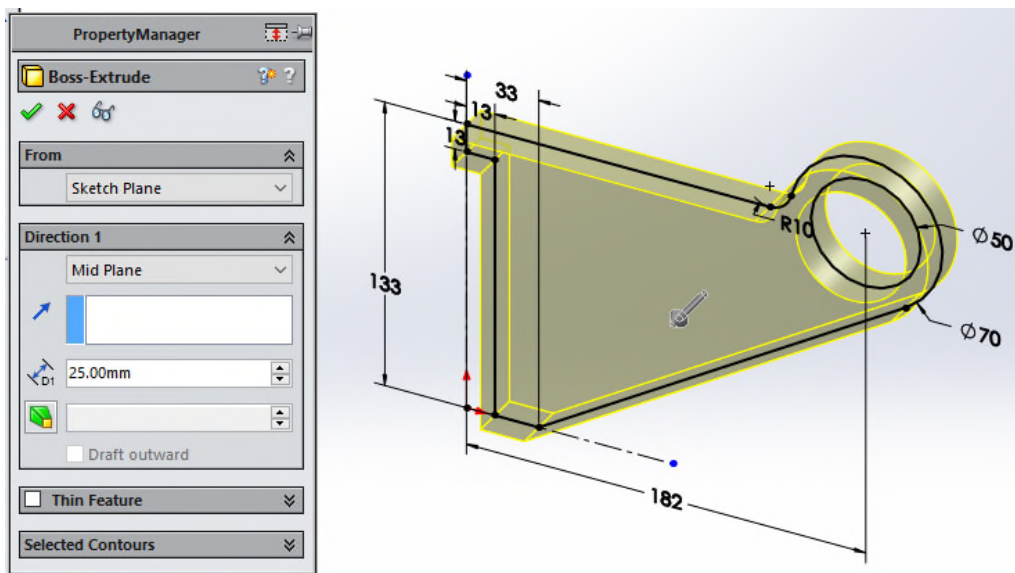
Step 2



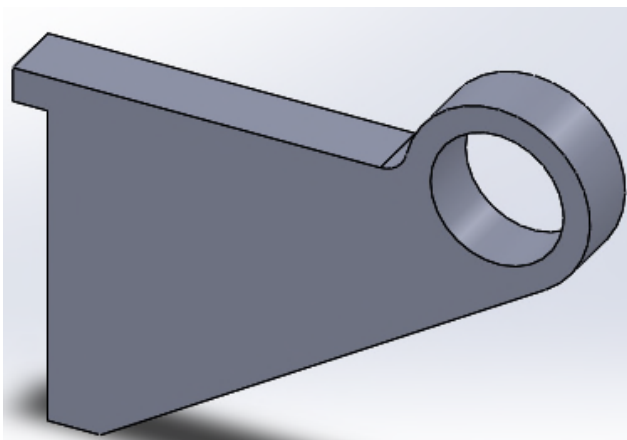
Step 3

**2. Problem 2-2**

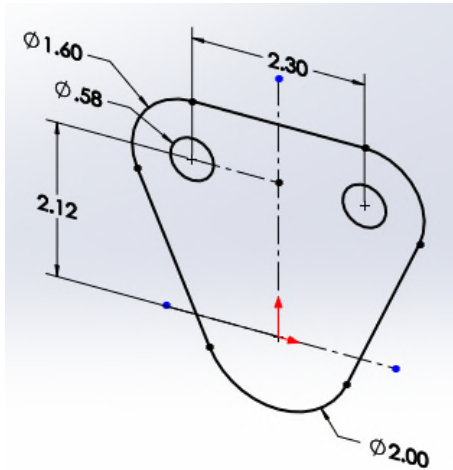
Step 1



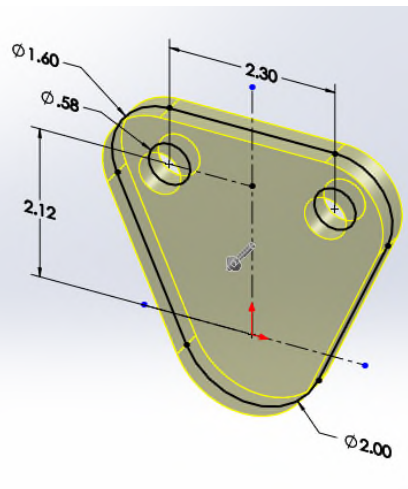
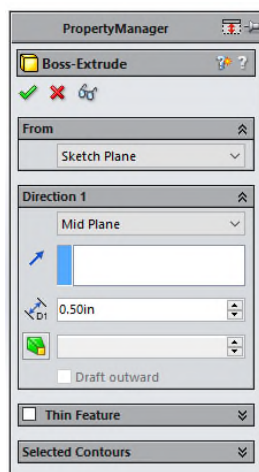
Step 2



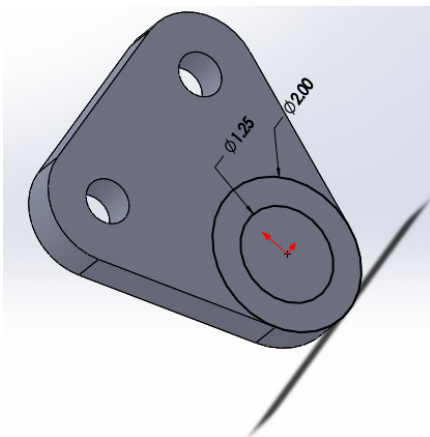
Step 3

**3. Problem 2-3**

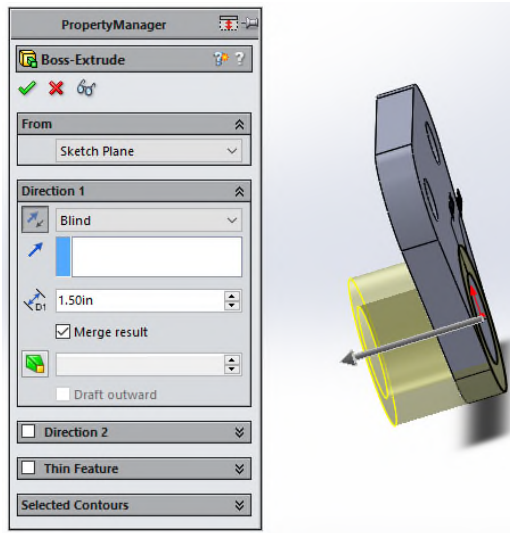
Step 1



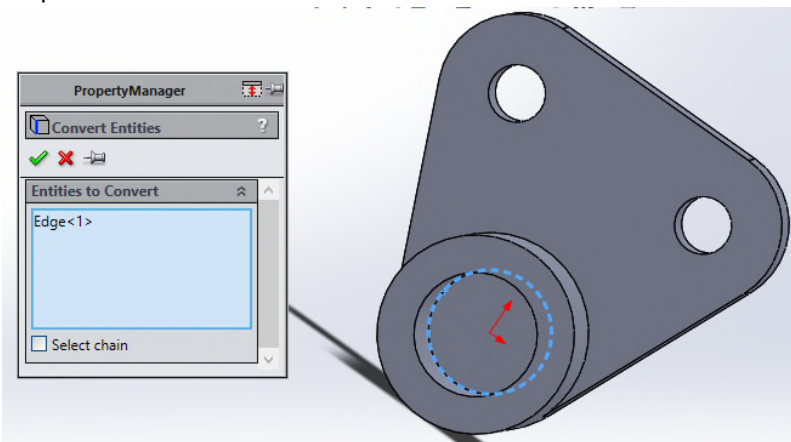
Step 2



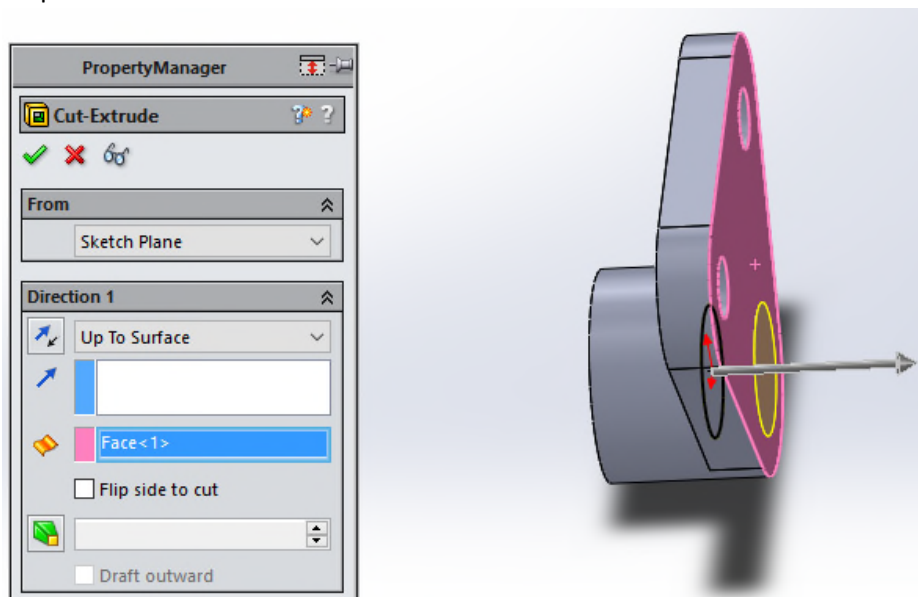
Step 3



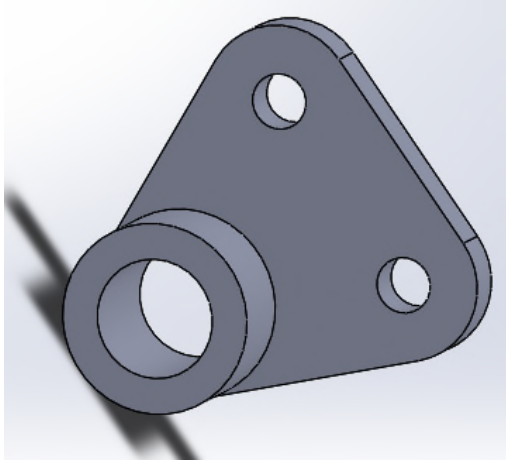
Step 4



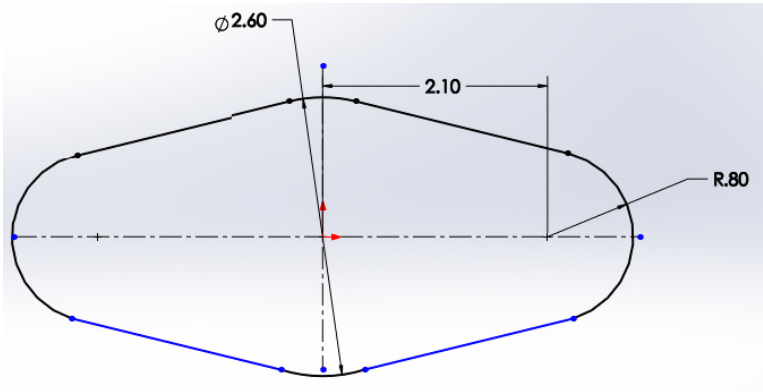
Step 5



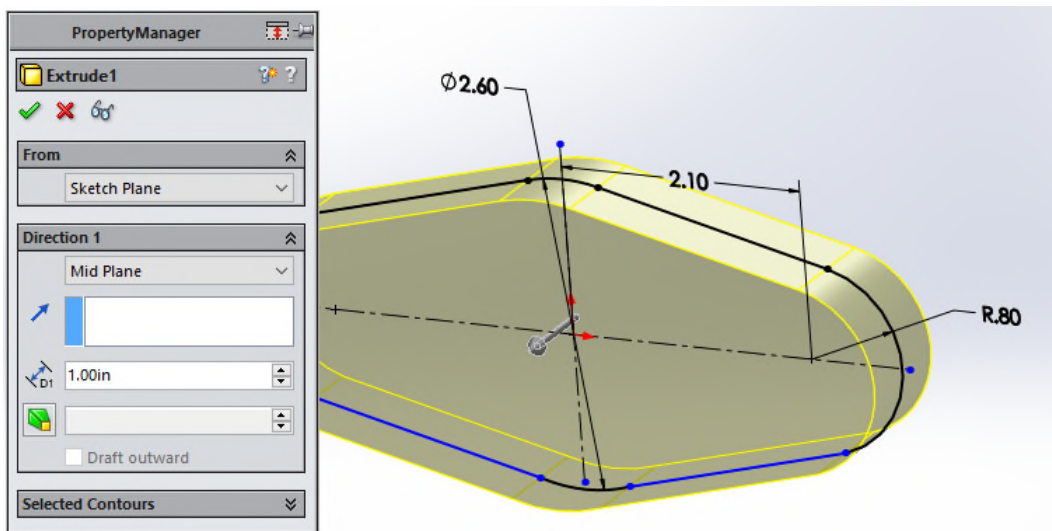
Step 6



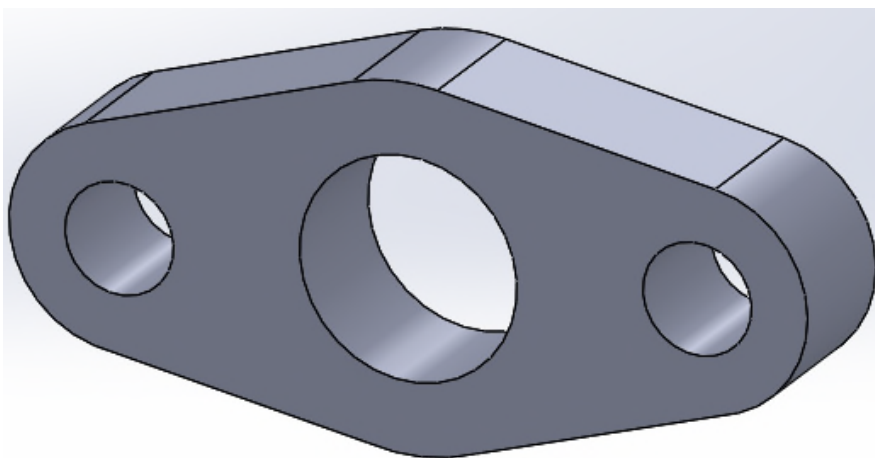
Step 7

**4. Problem 2-4**

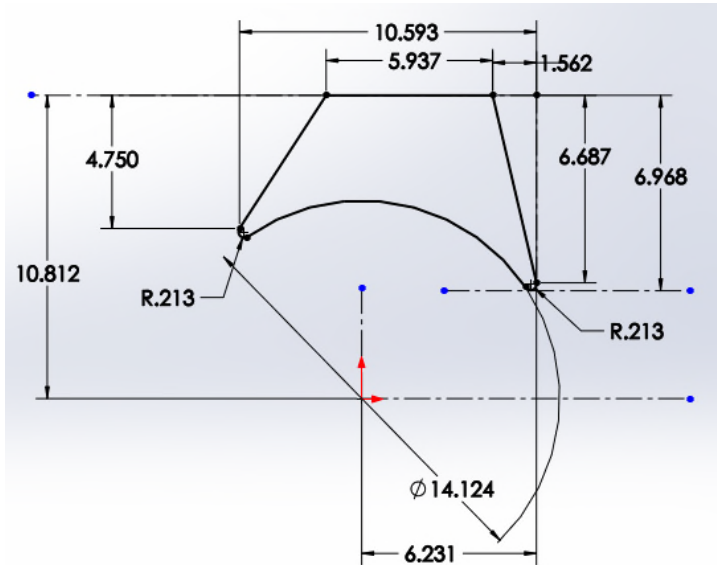
Step 1



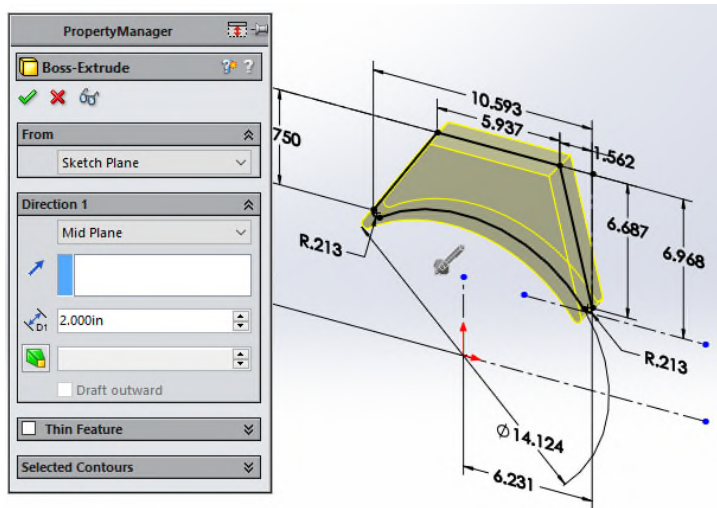
Step 2



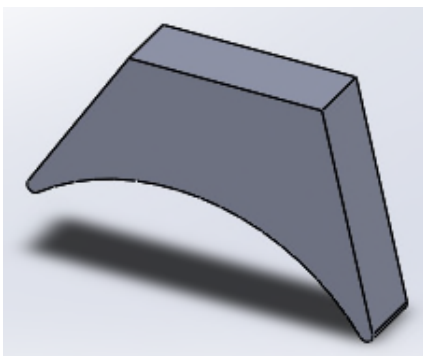
Step 3

**5. Problem 2-5**

Step 1

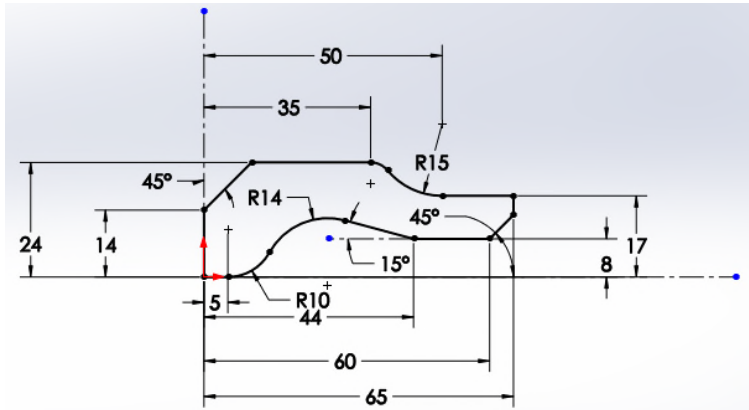


Step 2

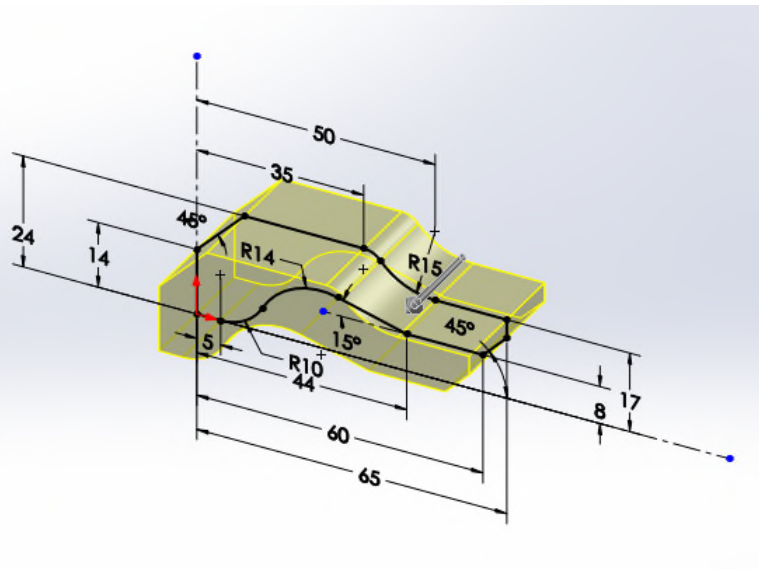
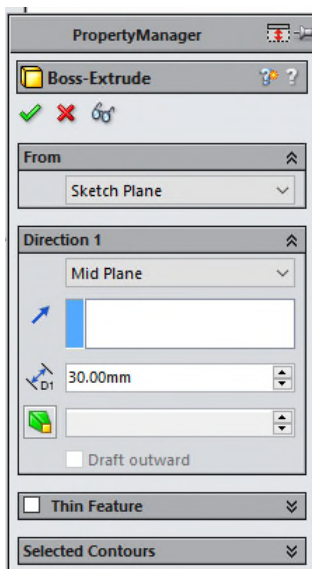


Step 3

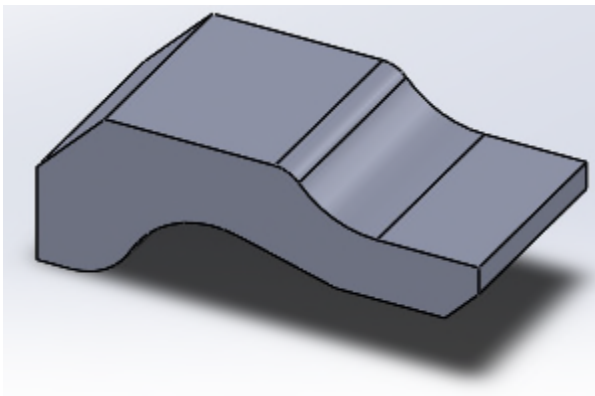


**6. Problem 2-6**

Step 1



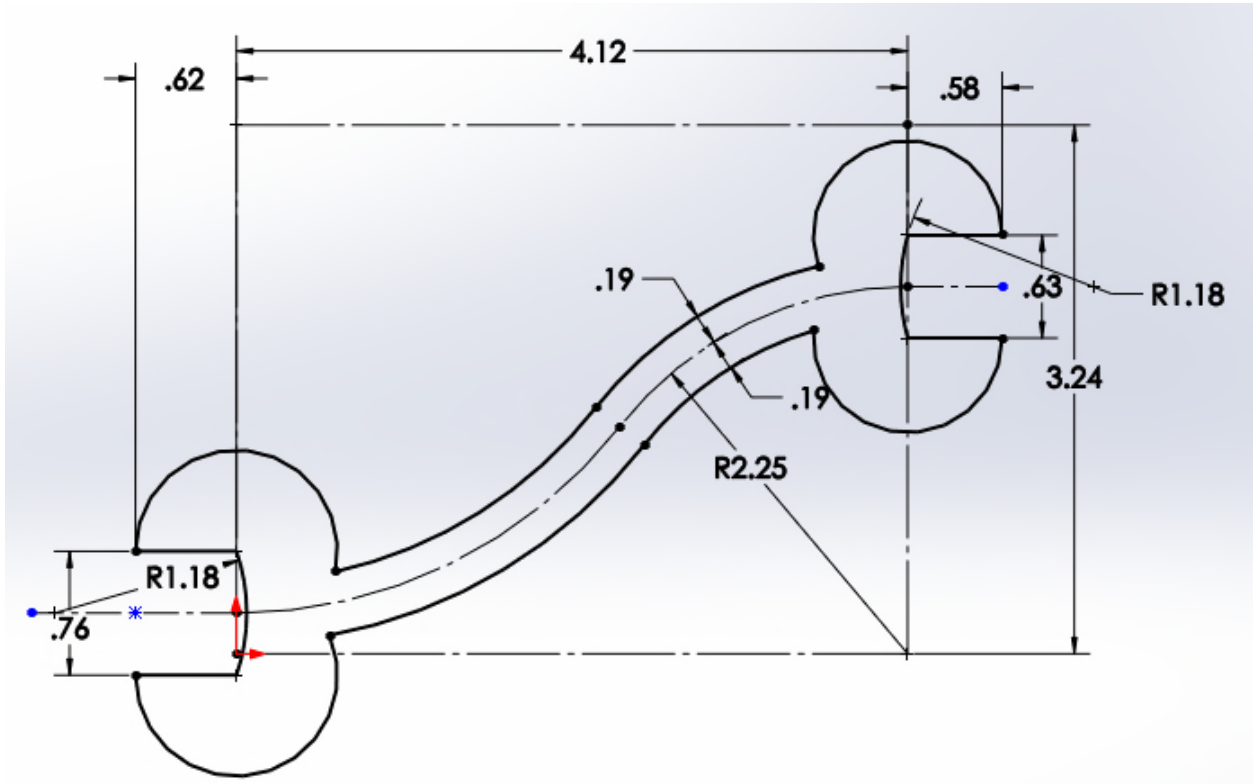
Step 2



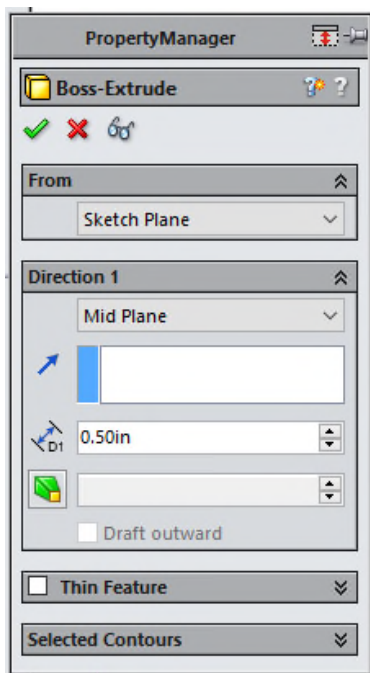
Step 3



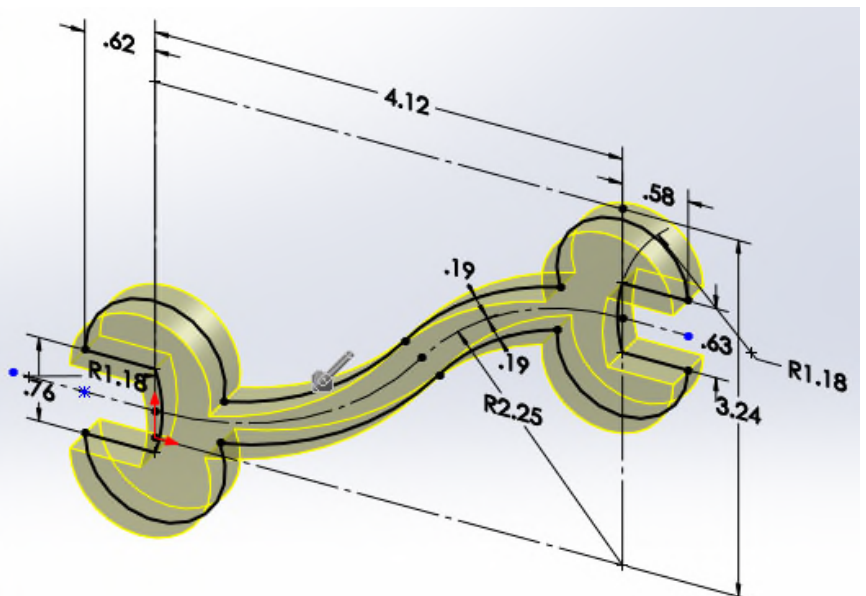
## 7. Problem 2-7

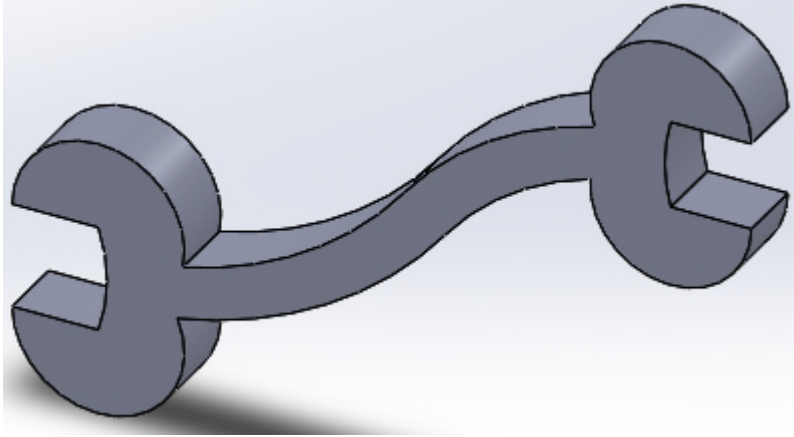


Step 1

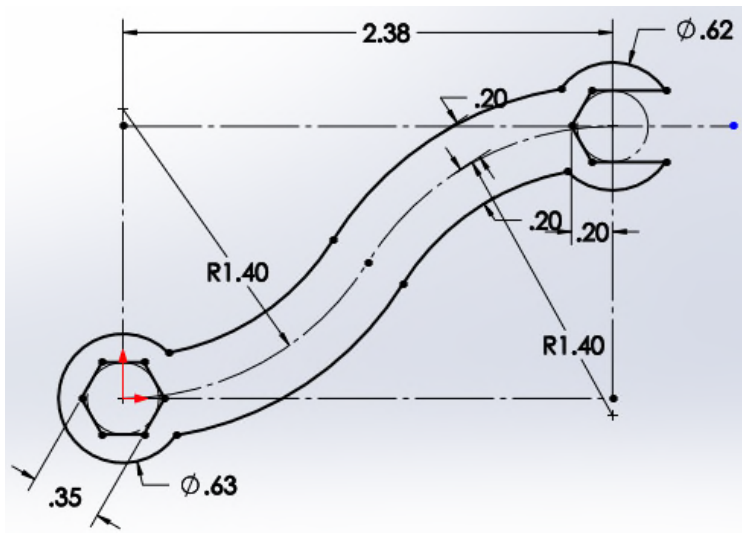


Step 2

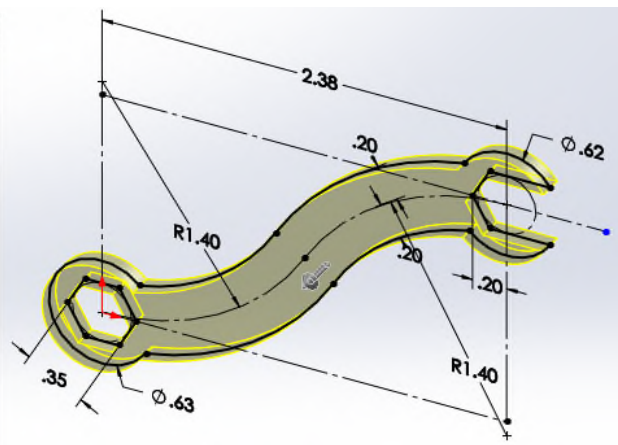
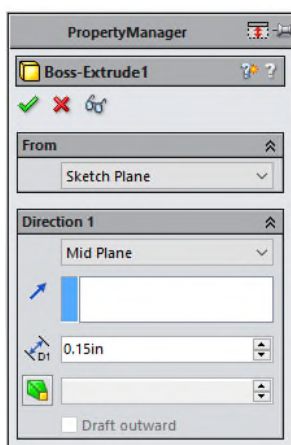




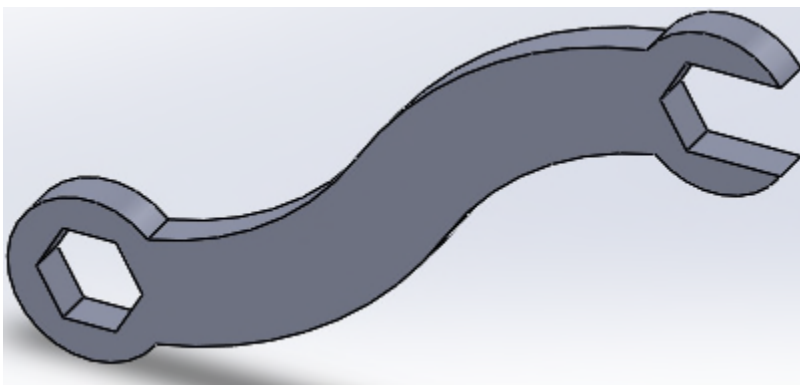
Step 3

**8. Problem 2-8**

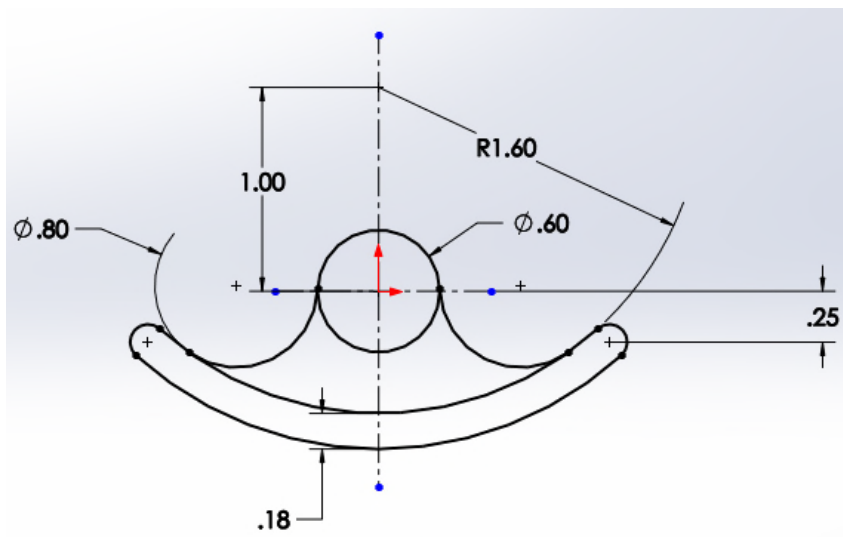
Step1



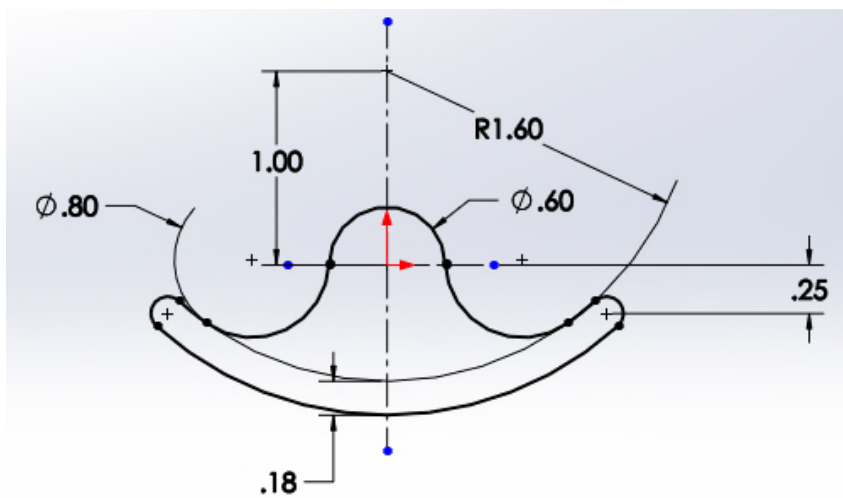
Step 2



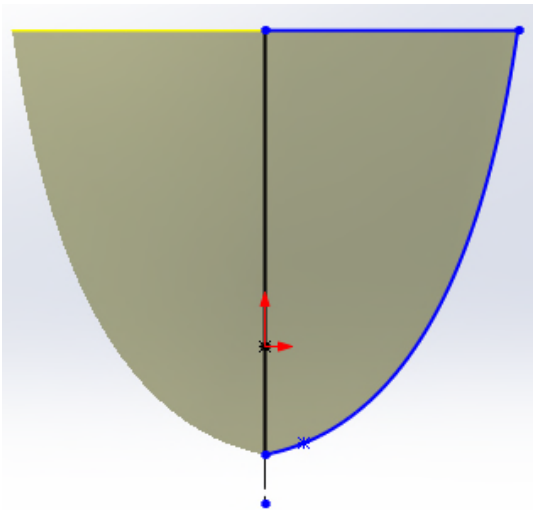
Step 3

**9. Problem 2-9**

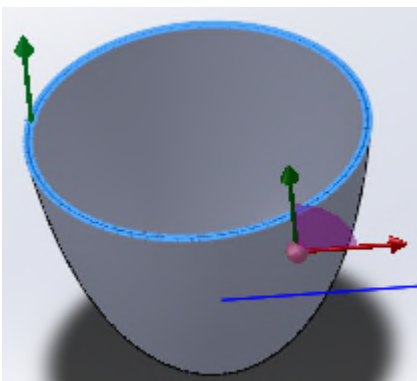
Step 1



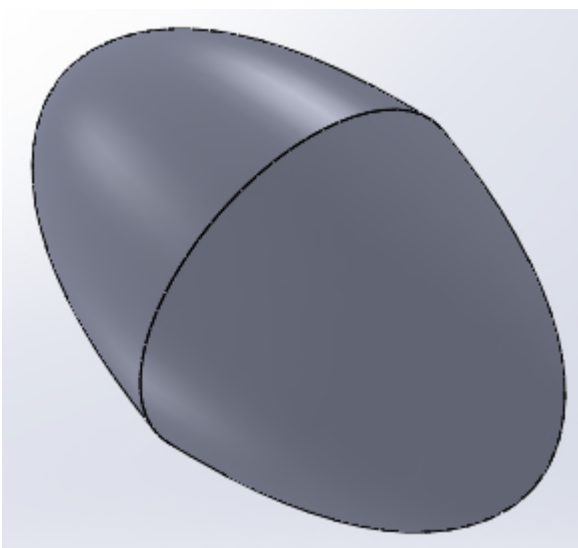
Step 2

**10. Problem 2-10**

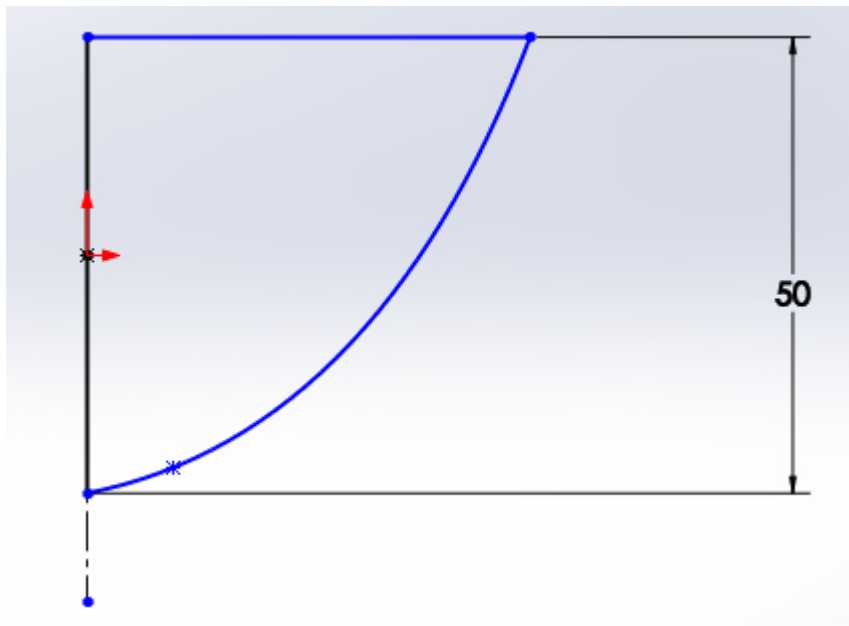
Step 1



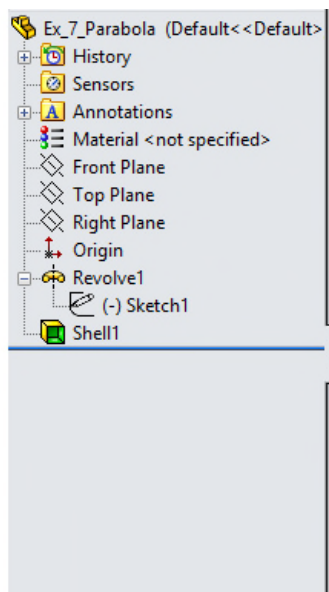
Step 2



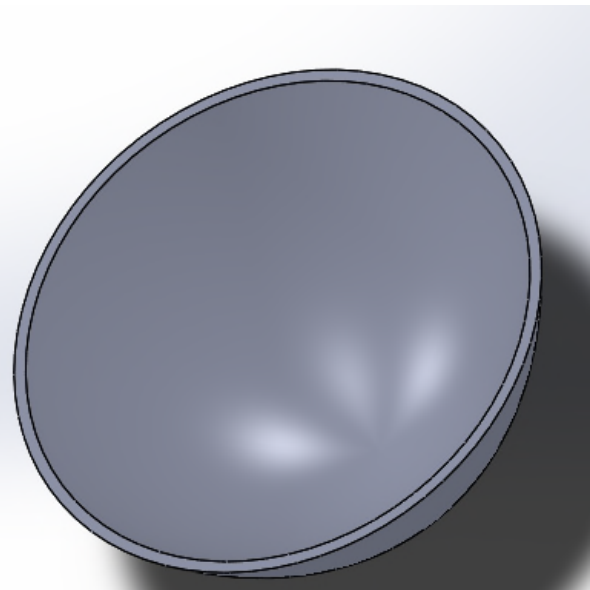
Step 3

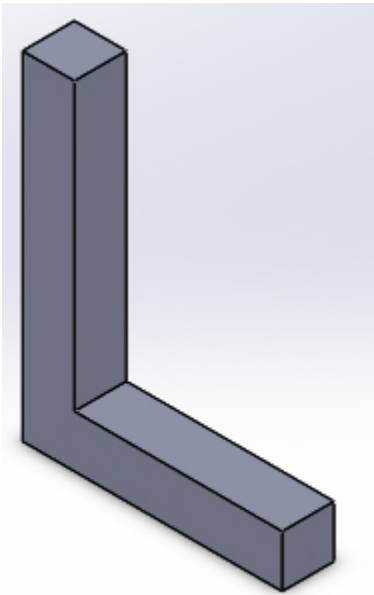
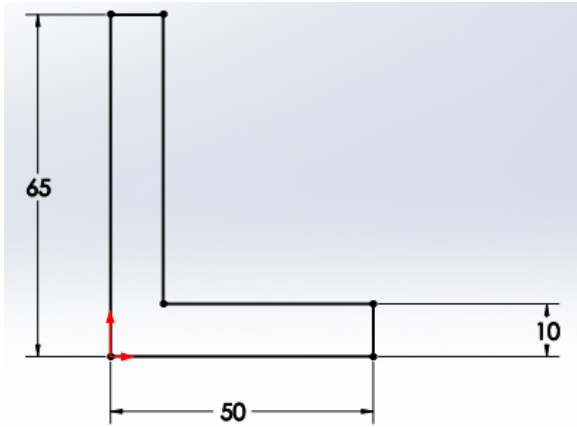
**11. Problem 2-11**

Step 1

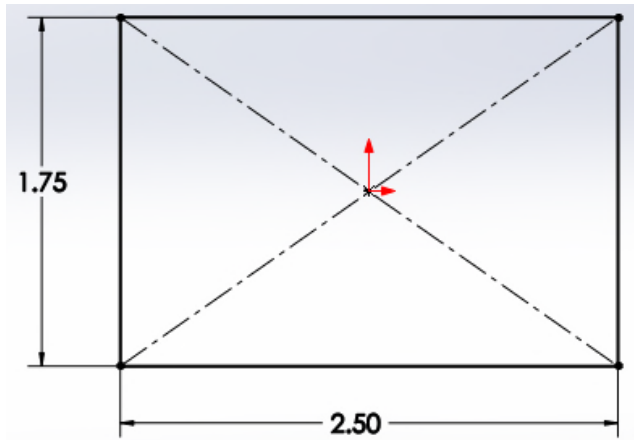


Step 2

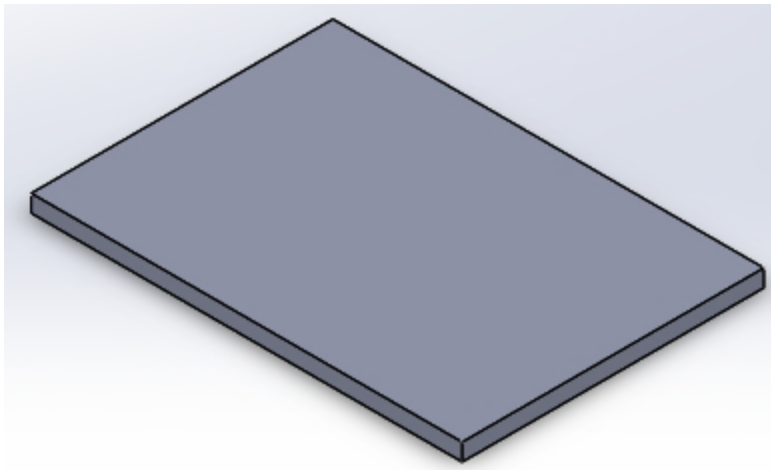


**12. Problem 2-12**

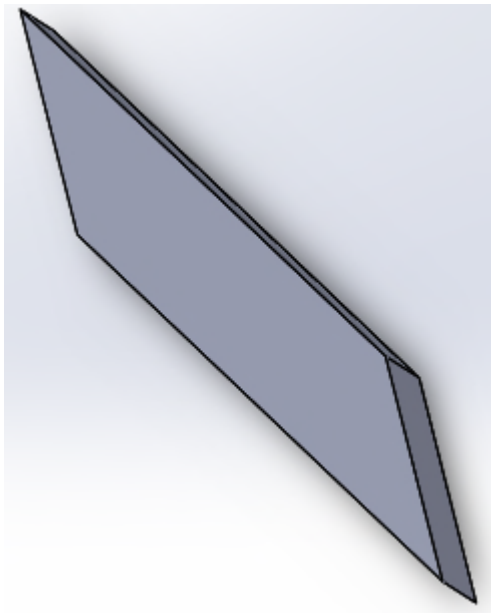
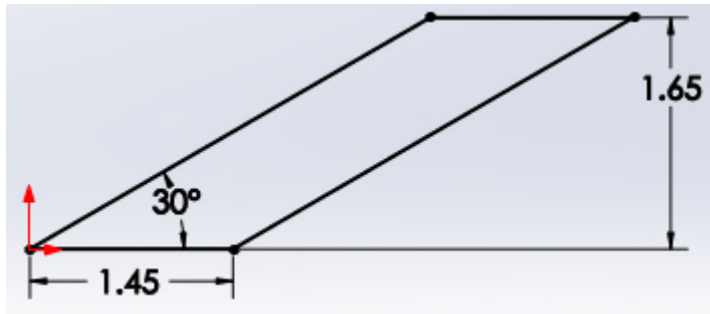


**13. Problem 2-13**

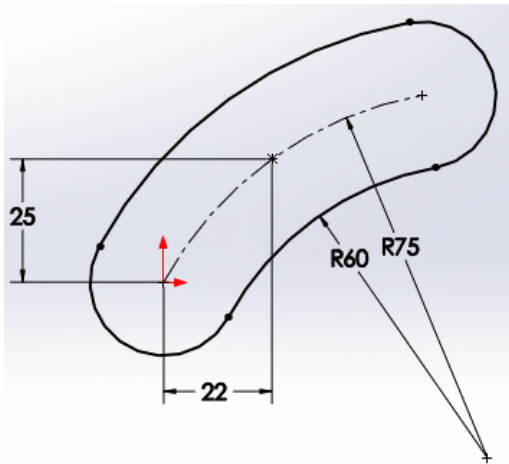
Step 1



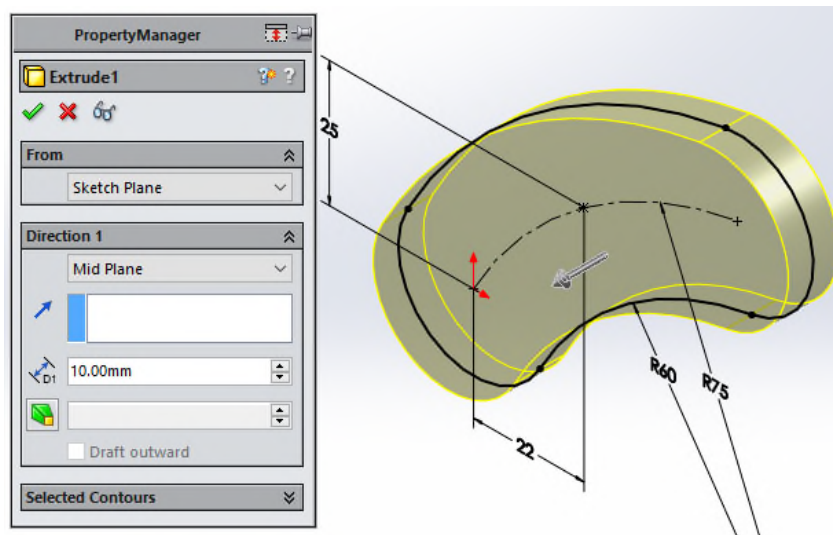
Step 2

**14. Problem 2-14**

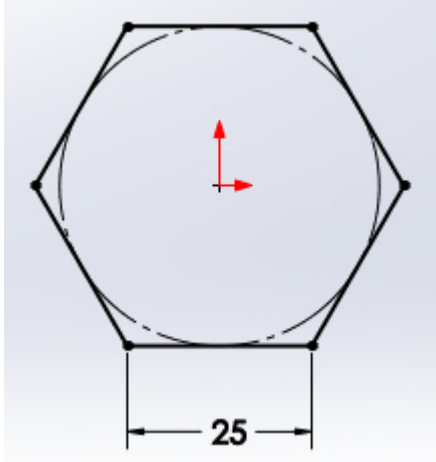
Step 2

**15. Problem 2-15**

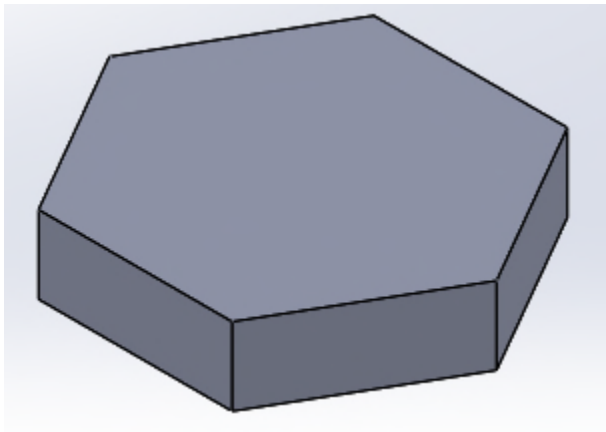
Step 1



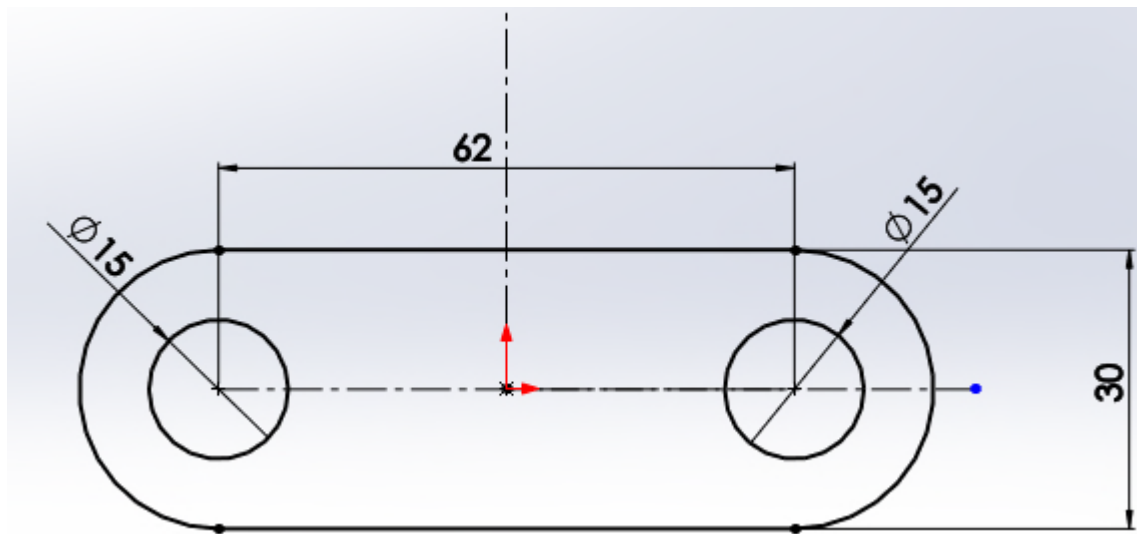
Step 2

**16. Problem 2-16**

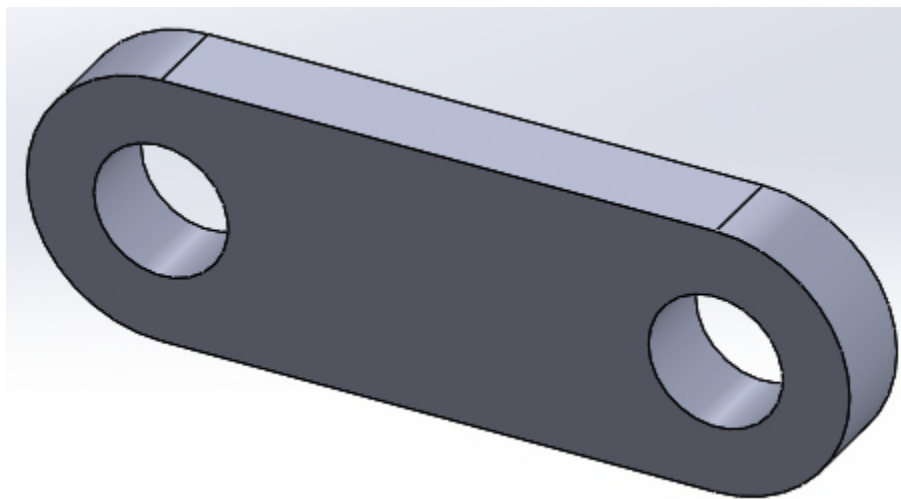
Step 1



Step 2

**17. Problem 2-17**

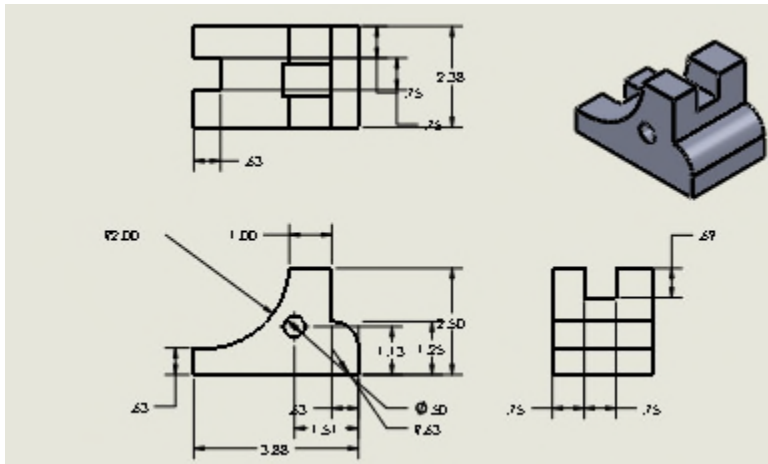
Step 1



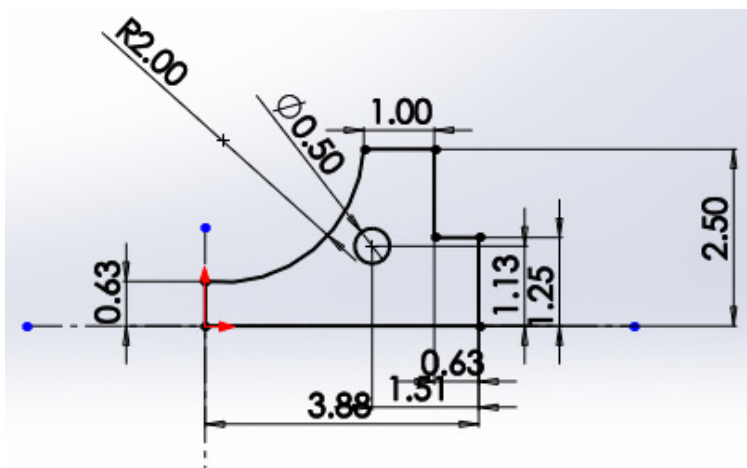
Step 2

## Chapter 3: Features

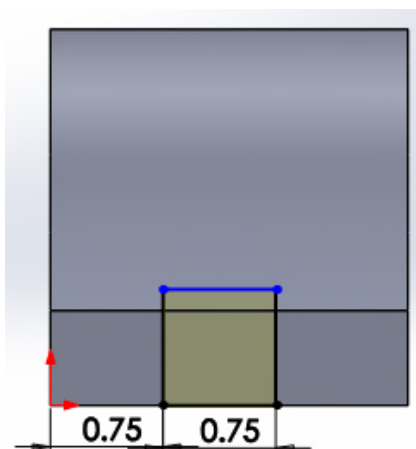
### 1. Problem 3-1



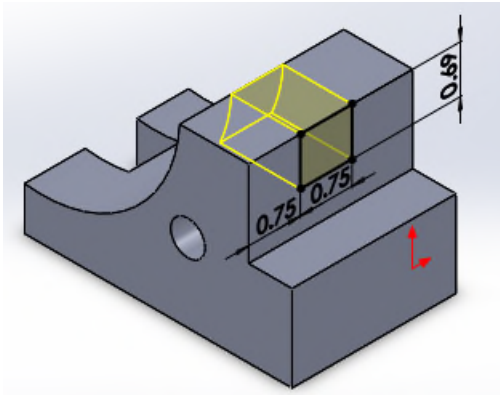
Given problem



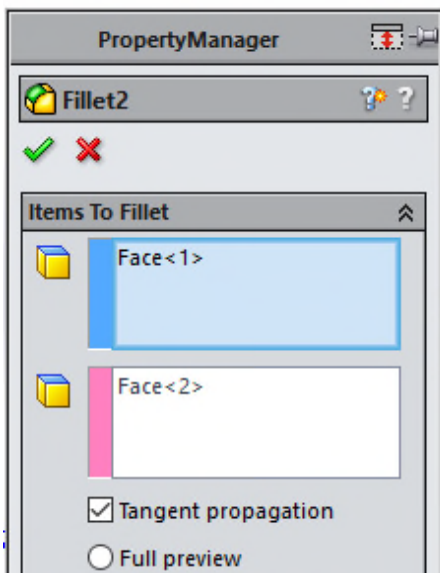
Step 1



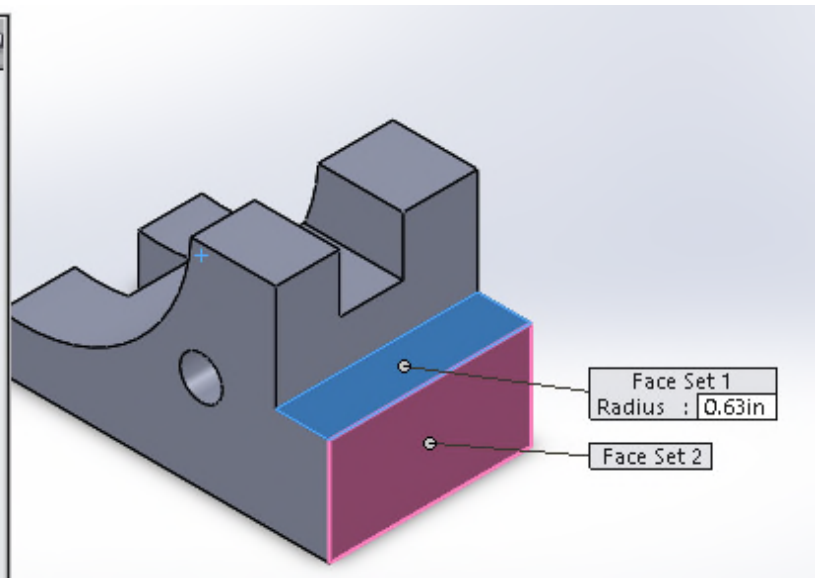
Step 2



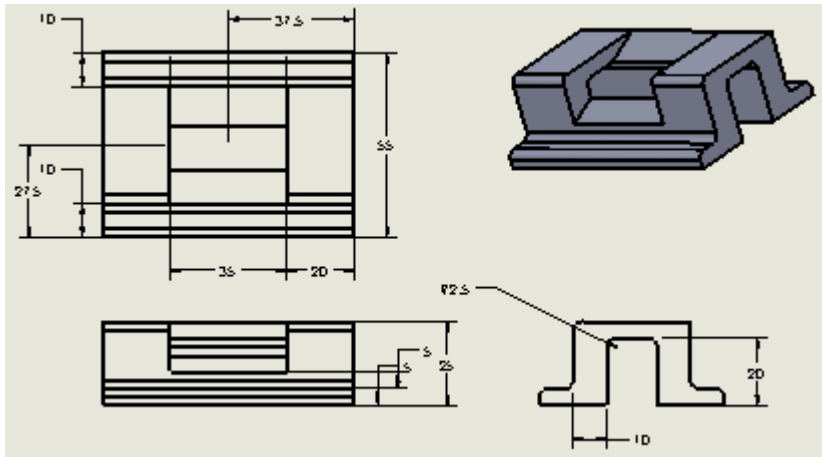
Step 3



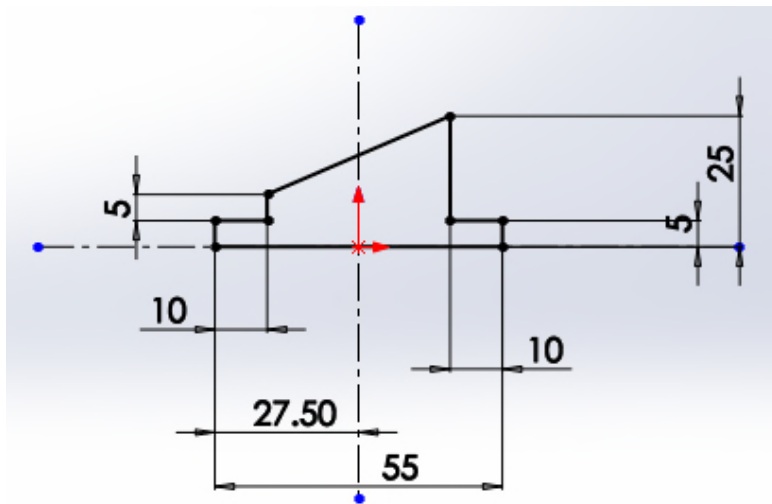
Step 4



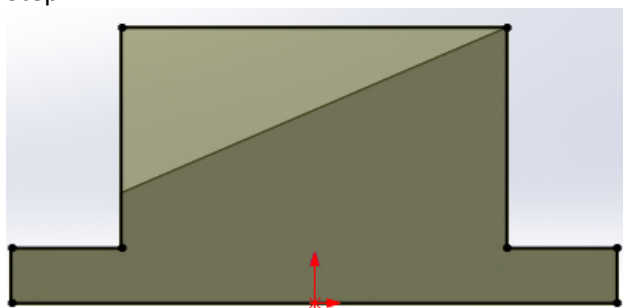


**2. Problem 3-2**

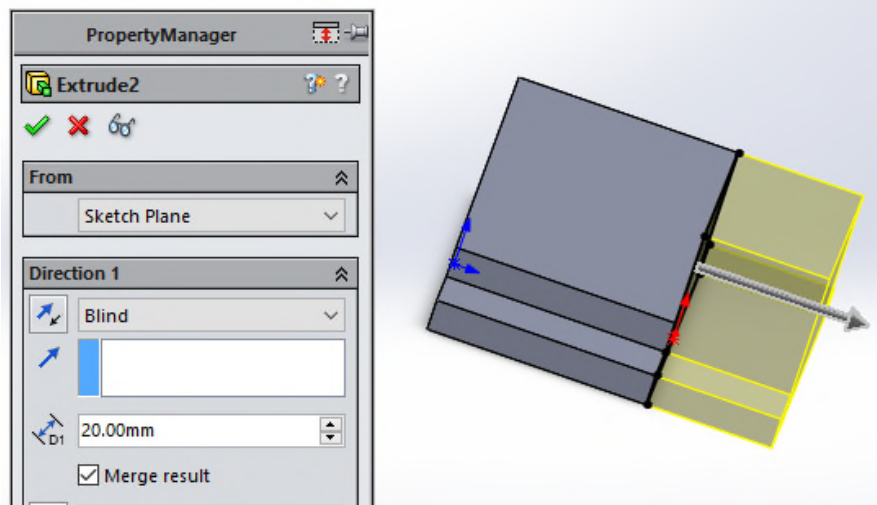
Given problem



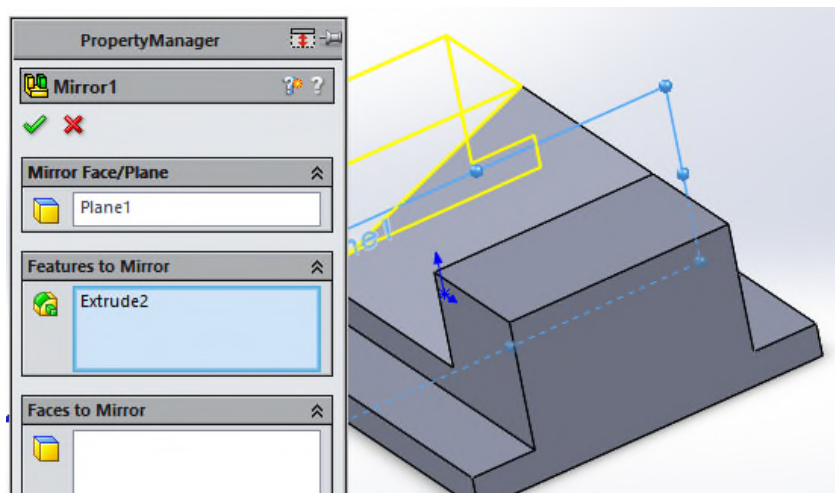
Step 1



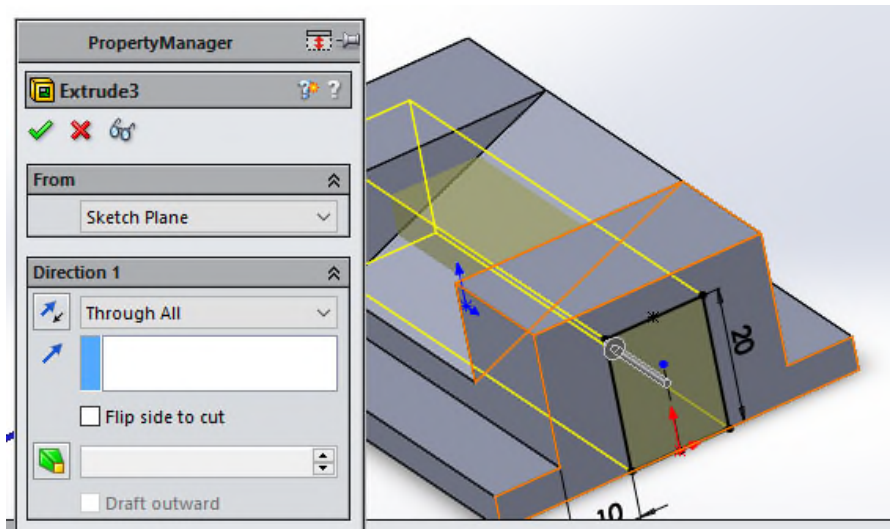
Step 2



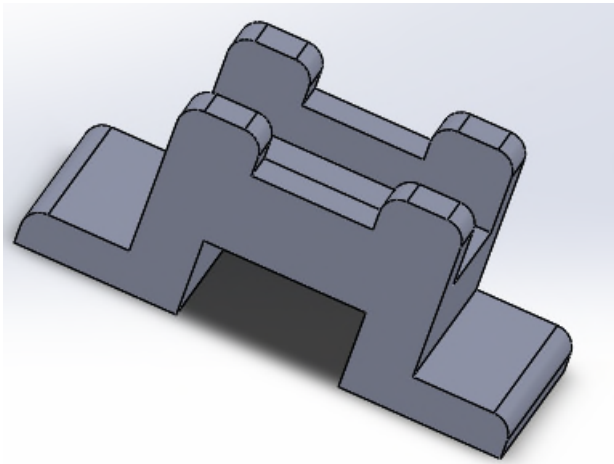
Step 3



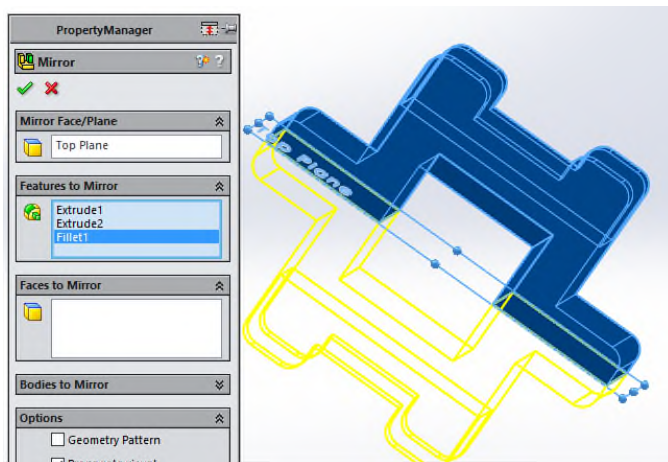
Step 4



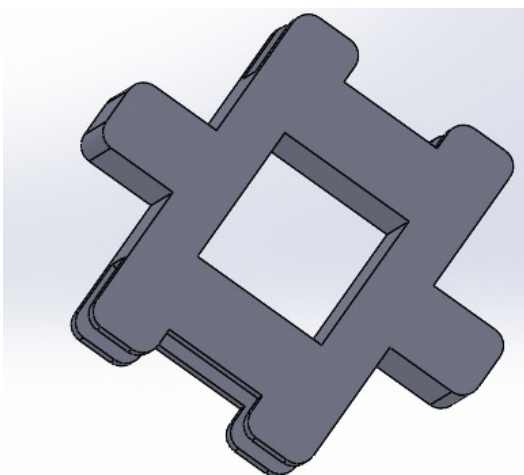
Step 5

**3. Problem 3-3**

Step 1



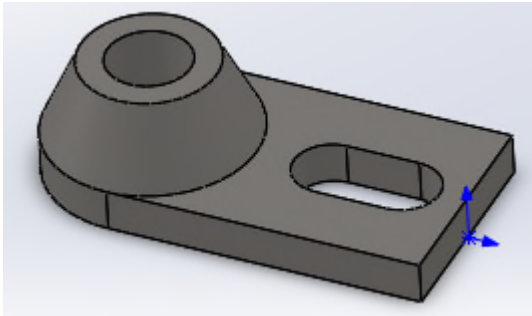
Step 2



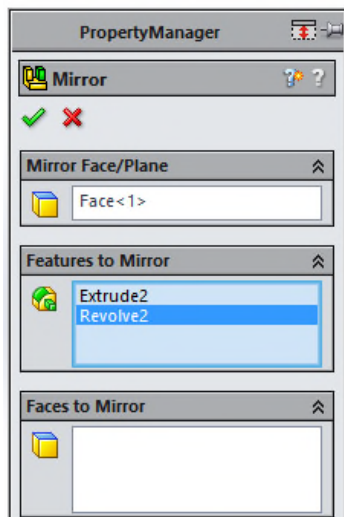
Step 3

## Chapter 4: Part Modeling—CSWA Preparations

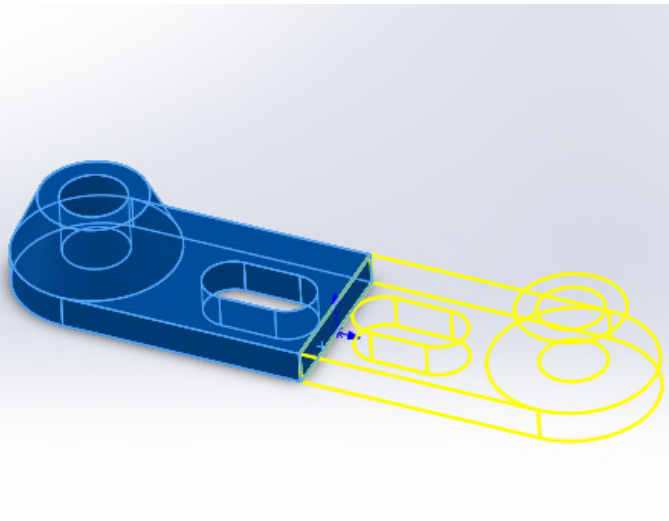
### 1. Problem 4-1

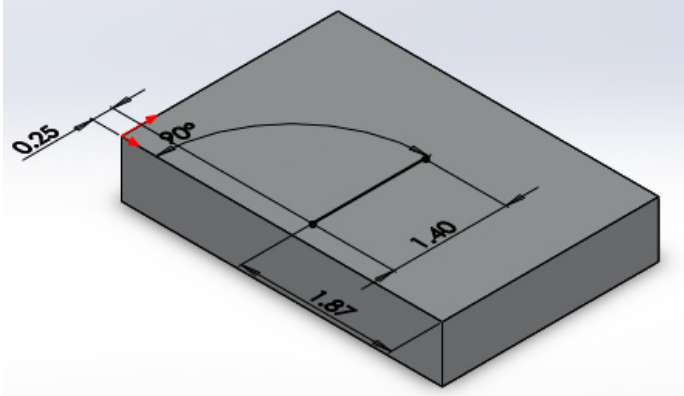


Step 1

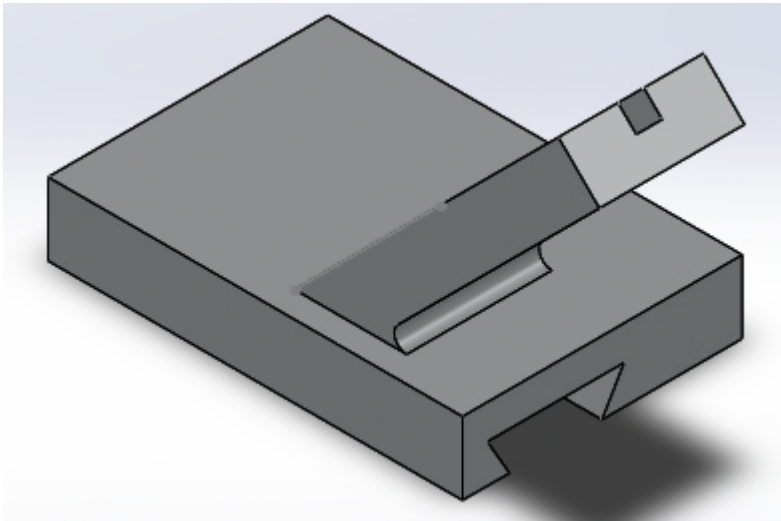


Step 2



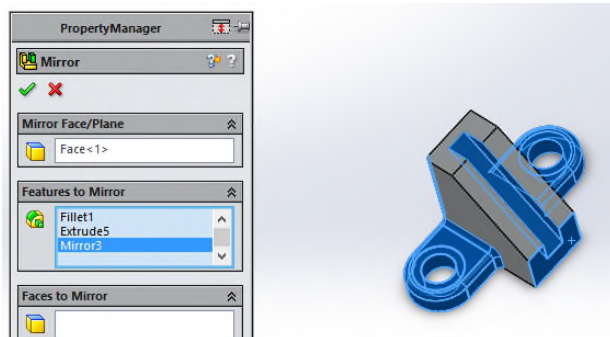
**2. Problem 4-2**

Step 1

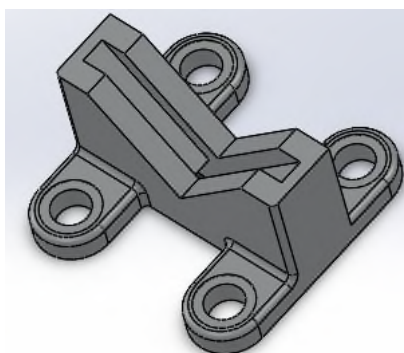


Step 2

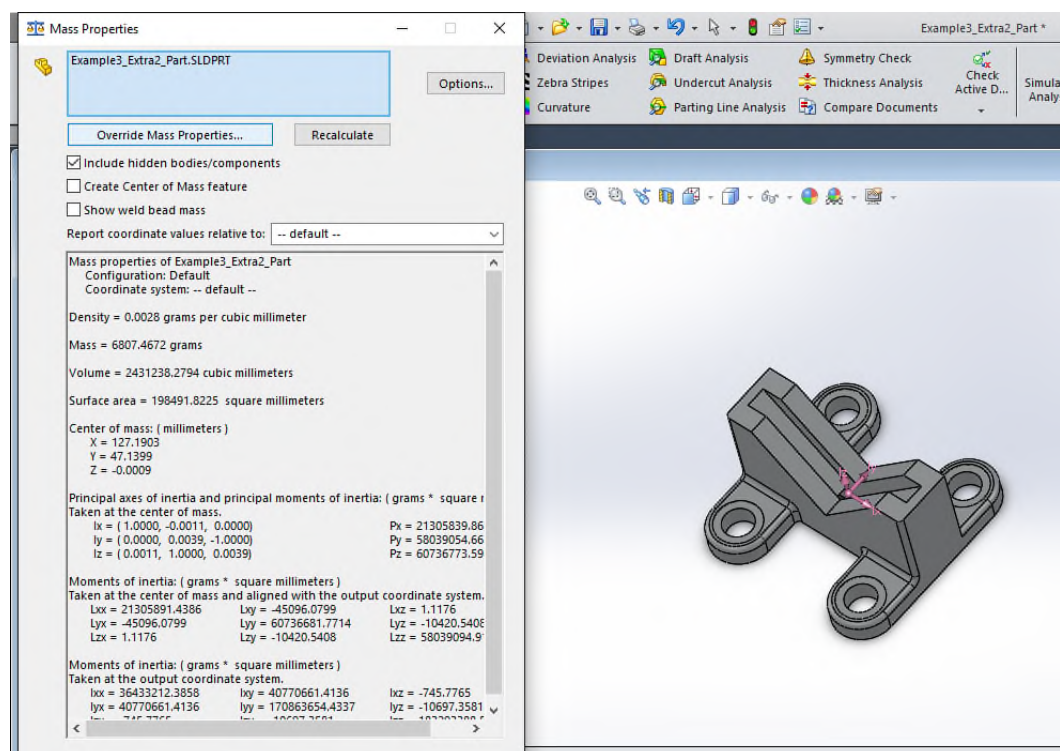
### 3. Problem 4-3



Step 1



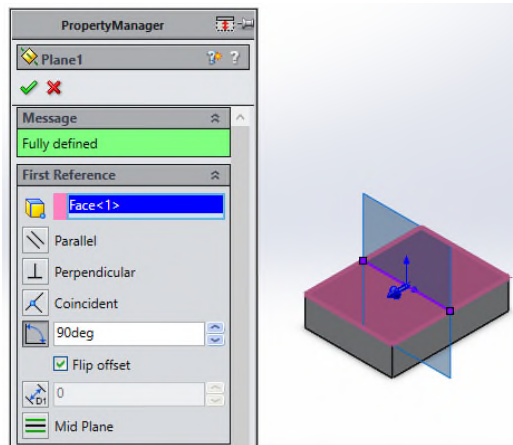
Step 2



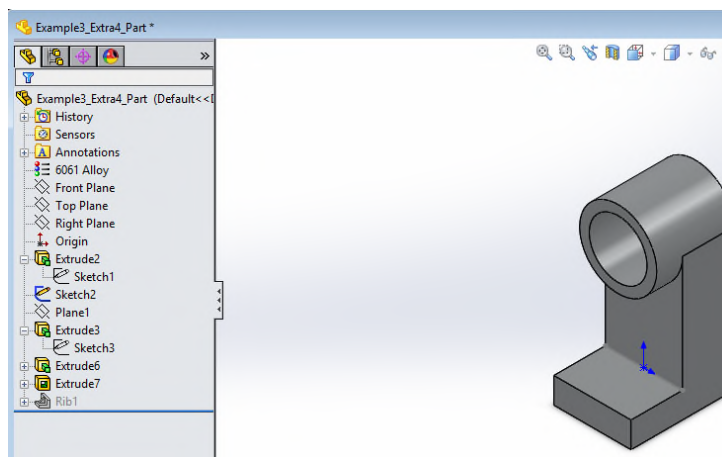
Step 3



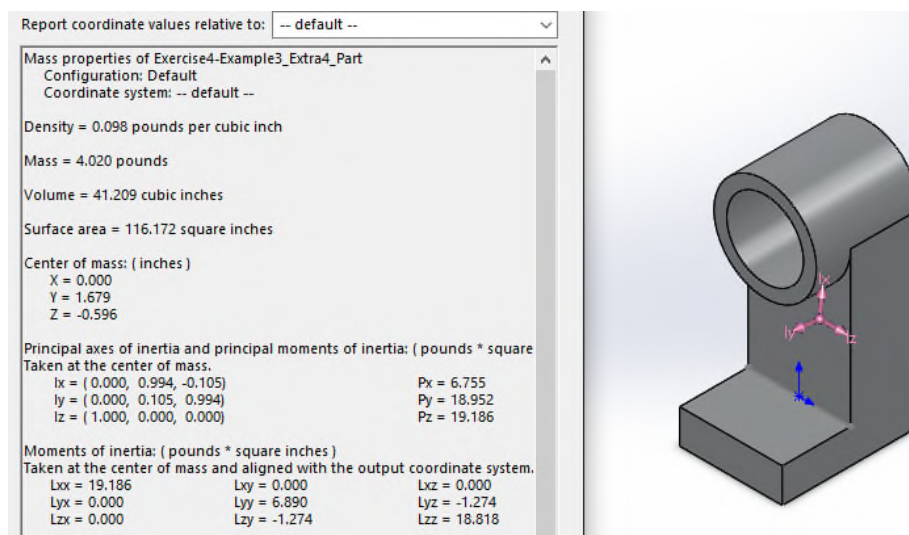
#### 4. Problem 4-4



Step 1



Step 2 [Note: rib is lost]

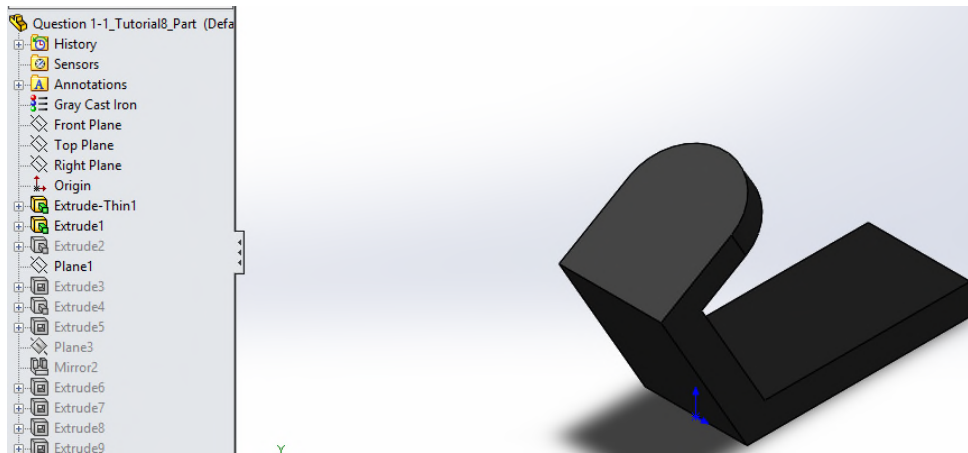


Step 3

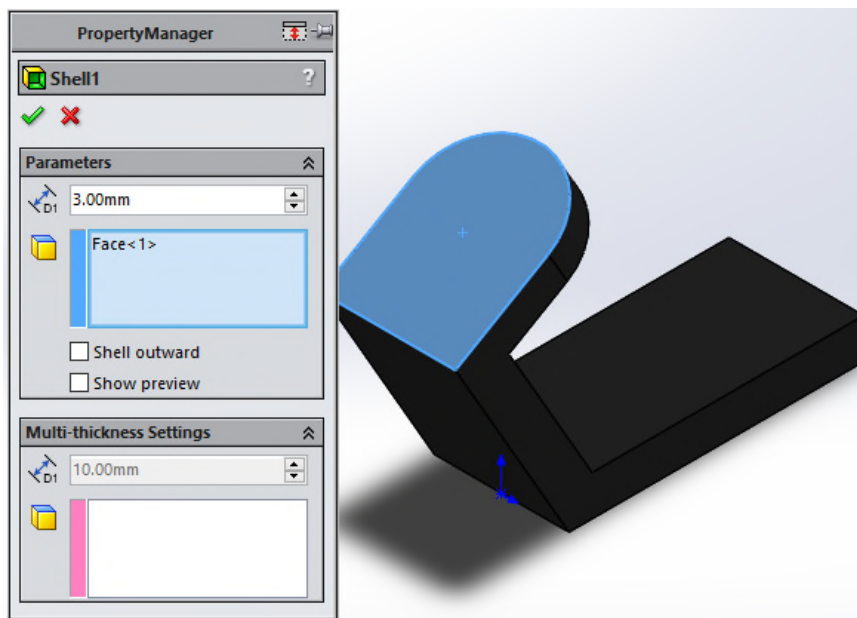


## Chapter 5: Part Modeling—CSWA Preparations

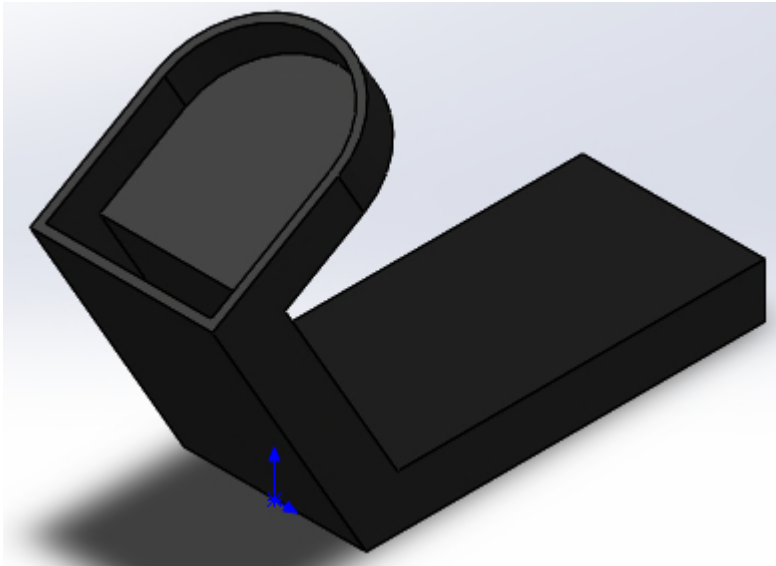
### 1. Problem 5-1



Step 1



Step 2



## Step 3

Mass properties of Question 1-1\_Tutorial8\_Part  
Configuration: Default  
Coordinate system: -- default --

Density = 0.01 grams per cubic millimeter

Mass = 916.71 grams

Volume = 127321.34 cubic millimeters

Surface area = 85680.49 square millimeters

Center of mass: ( millimeters )  
X = 0.00  
Y = 38.08  
Z = -30.63

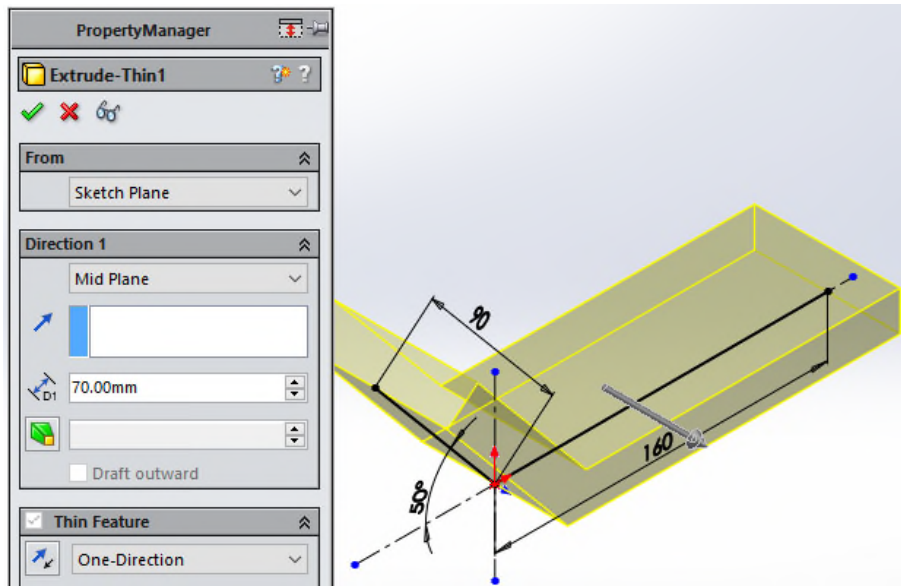
Principal axes of inertia and principal moments of inertia: ( grams \* square millimeters )  
Taken at the center of mass.  
I<sub>x</sub> = ( 0.00, 0.50, 0.87 )    P<sub>x</sub> = 1044753.21  
I<sub>y</sub> = ( 0.00, -0.87, 0.50 )    P<sub>y</sub> = 3817601.18  
I<sub>z</sub> = ( 1.00, 0.00, 0.00 )    P<sub>z</sub> = 4052969.20

Moments of inertia: ( grams \* square millimeters )  
Taken at the center of mass and aligned with the output coordinate system.  
L<sub>xx</sub> = 4052969.20    L<sub>xy</sub> = 0.00    L<sub>xz</sub> = 0.00  
L<sub>yx</sub> = 0.00    L<sub>yy</sub> = 3136860.11    L<sub>yz</sub> = 1193391.42  
L<sub>zx</sub> = 0.00    L<sub>zy</sub> = 1193391.42    L<sub>zz</sub> = 1725494.28

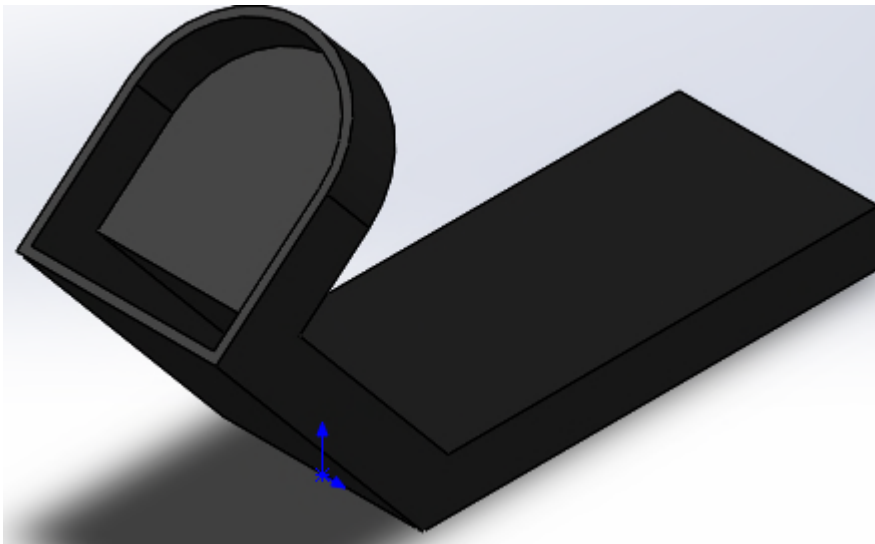
Moments of inertia: ( grams \* square millimeters )  
Taken at the output coordinate system.  
I<sub>xx</sub> = 6242390.44    I<sub>xy</sub> = 0.00    I<sub>xz</sub> = 0.00  
I<sub>yx</sub> = 0.00    I<sub>yy</sub> = 3996764.09    I<sub>yz</sub> = 124159.37  
I<sub>zx</sub> = 0.00    I<sub>zy</sub> = 124159.37    I<sub>zz</sub> = 3055044.03

A 3D model of the same mechanical part, shown in a perspective view. A coordinate system (I<sub>x</sub>, I<sub>y</sub>, I<sub>z</sub>) is visible on the part. A blue arrow points to a specific dimension on the part.

## Step 4

**2. Problem 5-2**

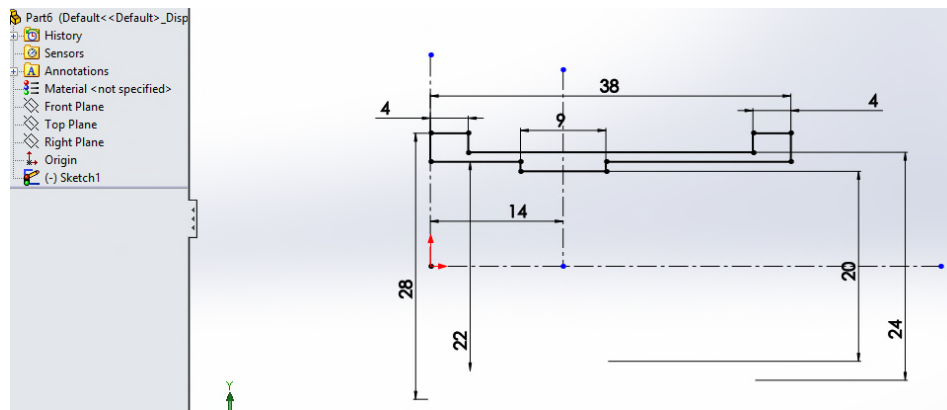
Step 1



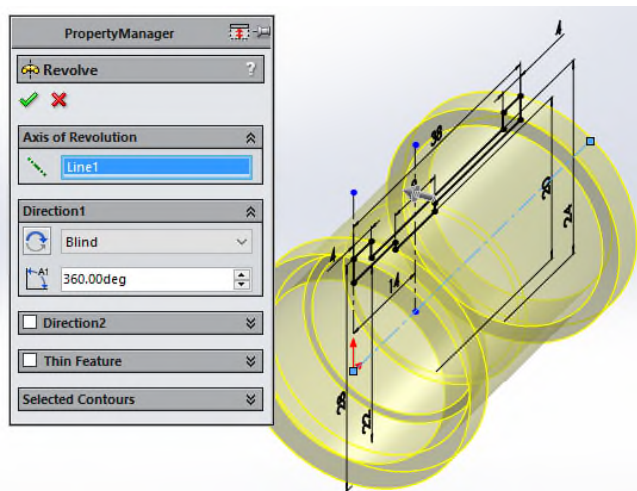
Step 2

## Projects

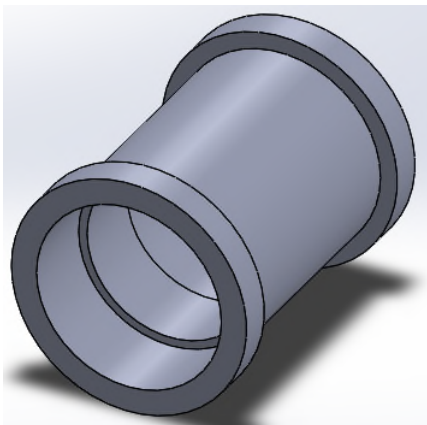
### 3. P1



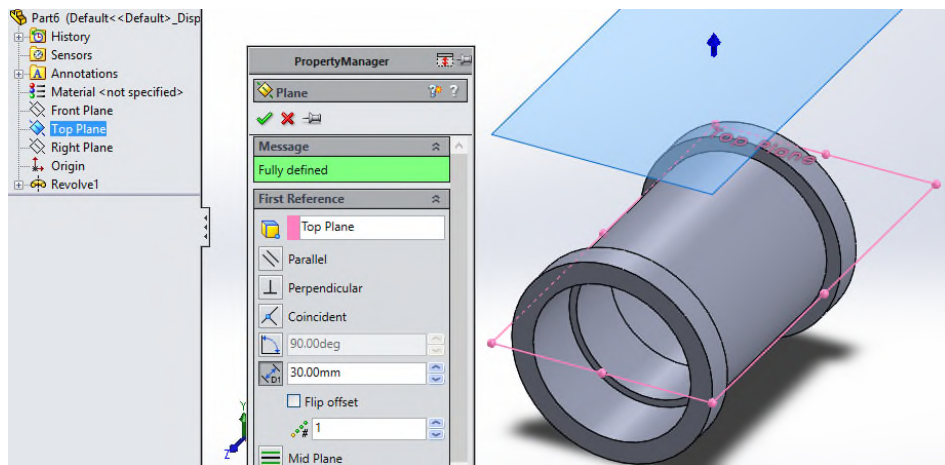
Step 1



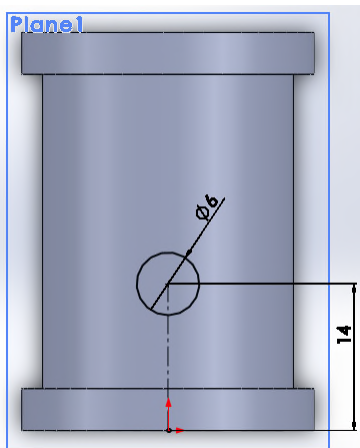
Step 2



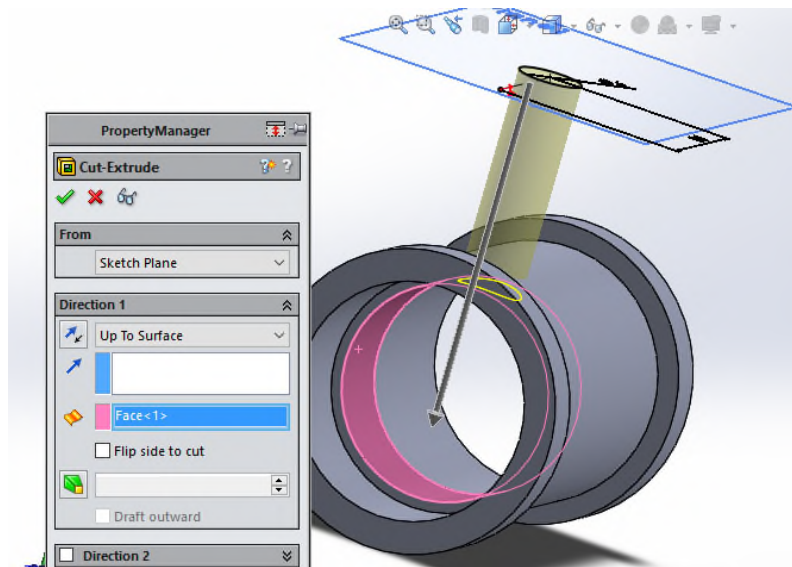
Step 3



Step 4

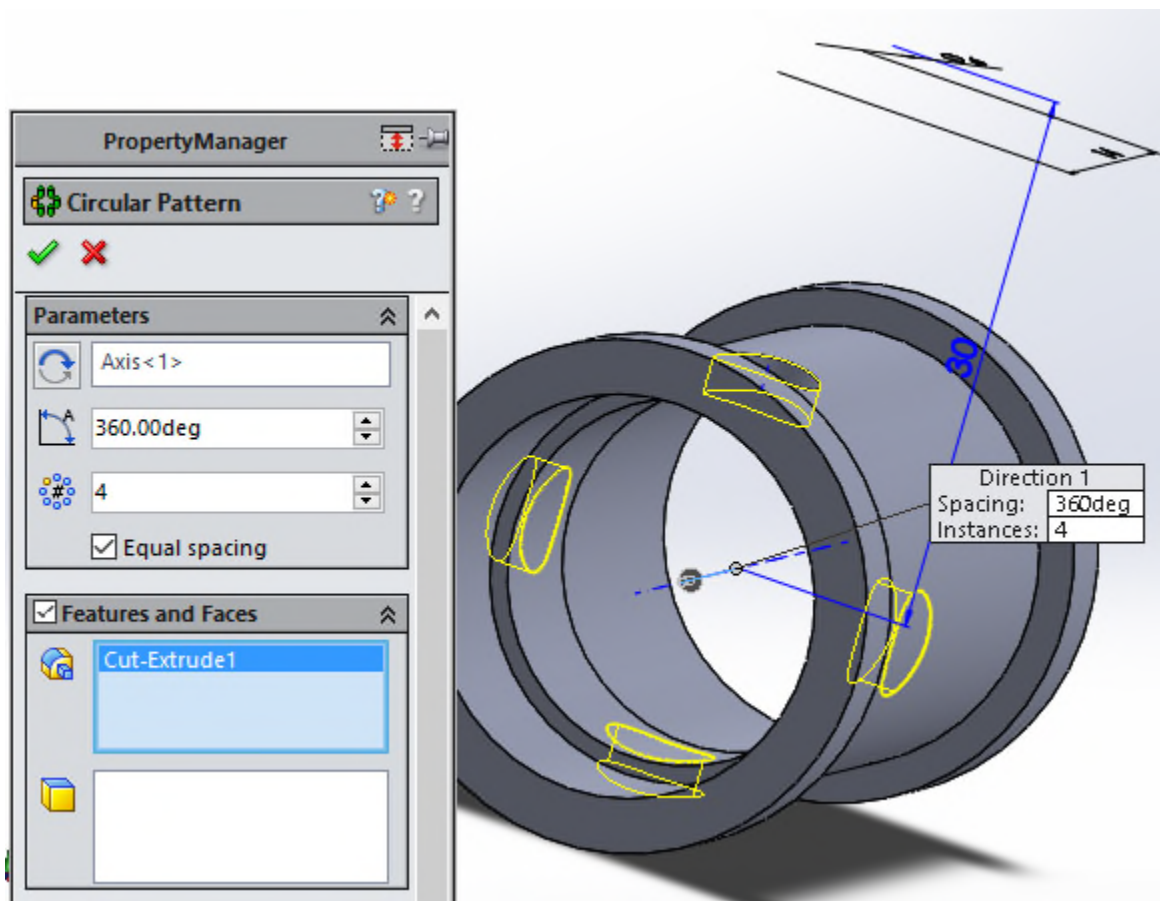


Step 5

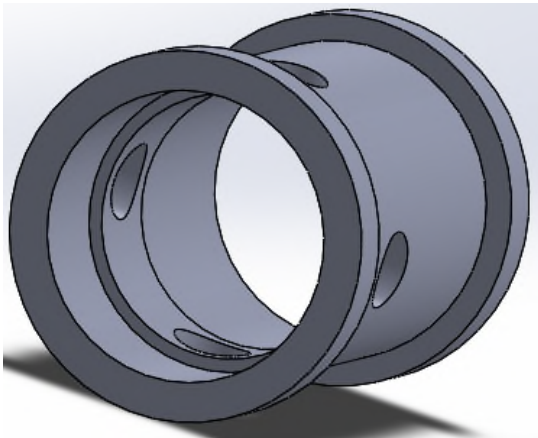


Step 6

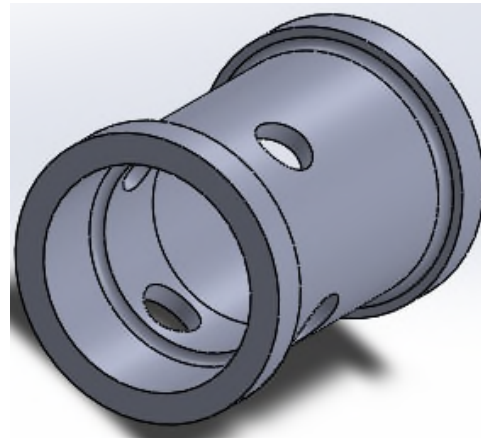




Step 7

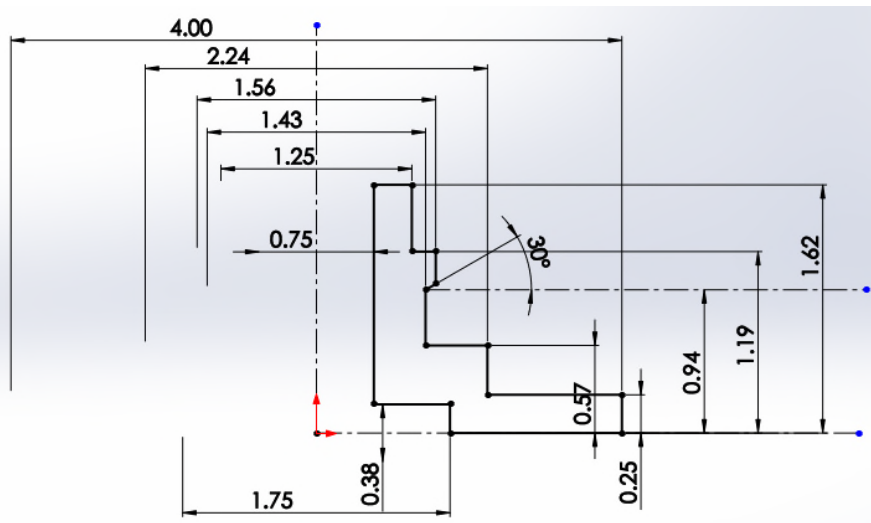


Step 8

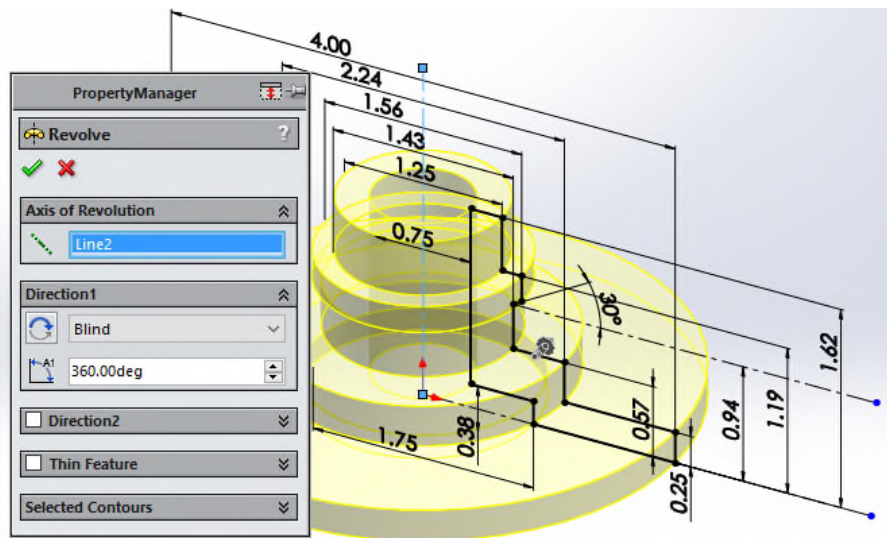


Step 9

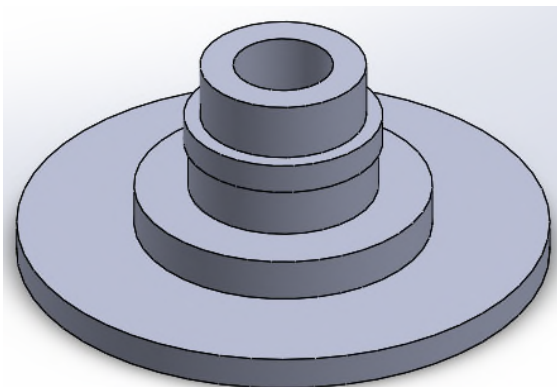
4. P2



Step 1



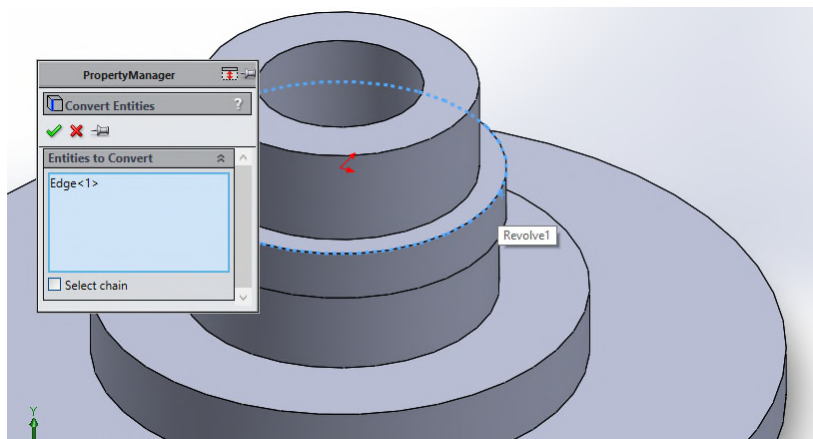
Step 2



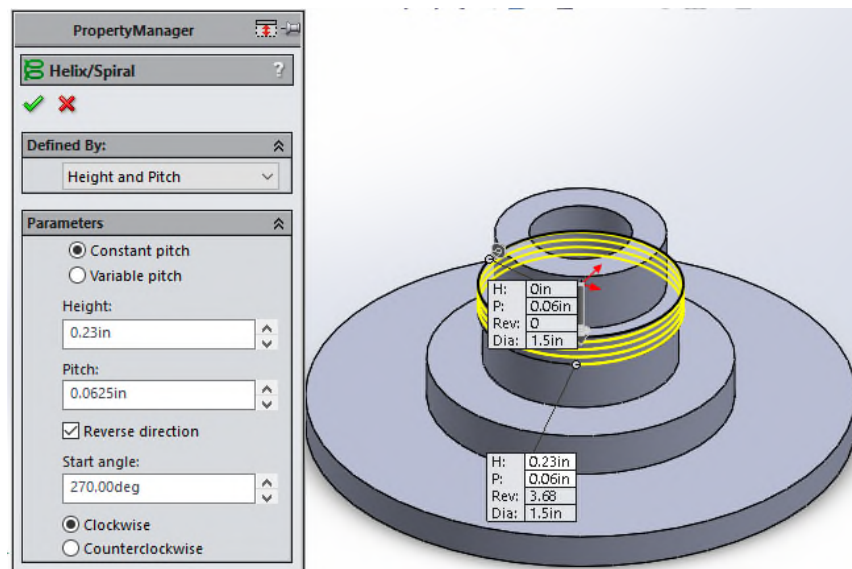
Step 3



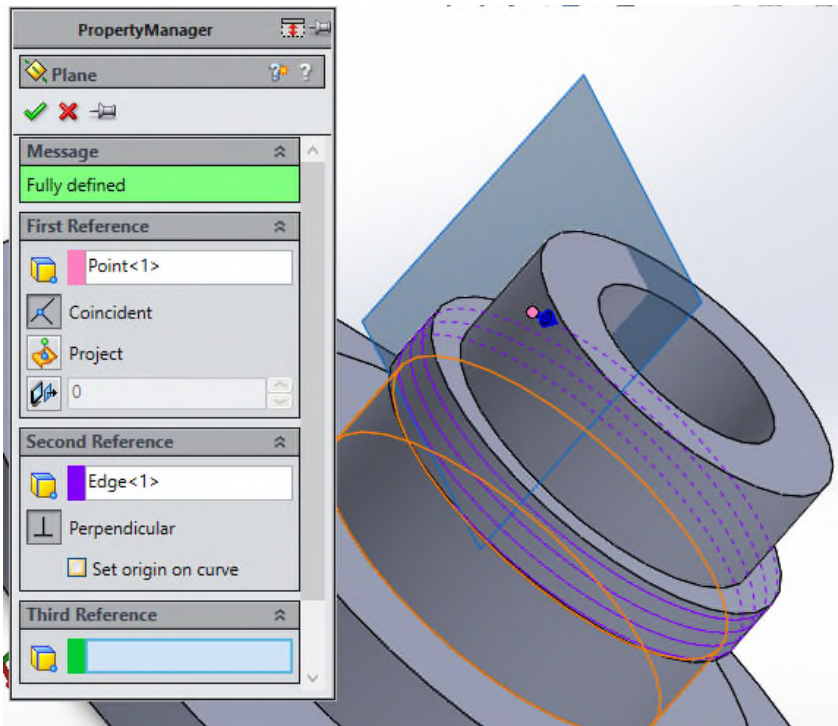
Use all formulas in chapter 30 for design of external threads; note that the diameter of 1.56 will reduce to 1.49.



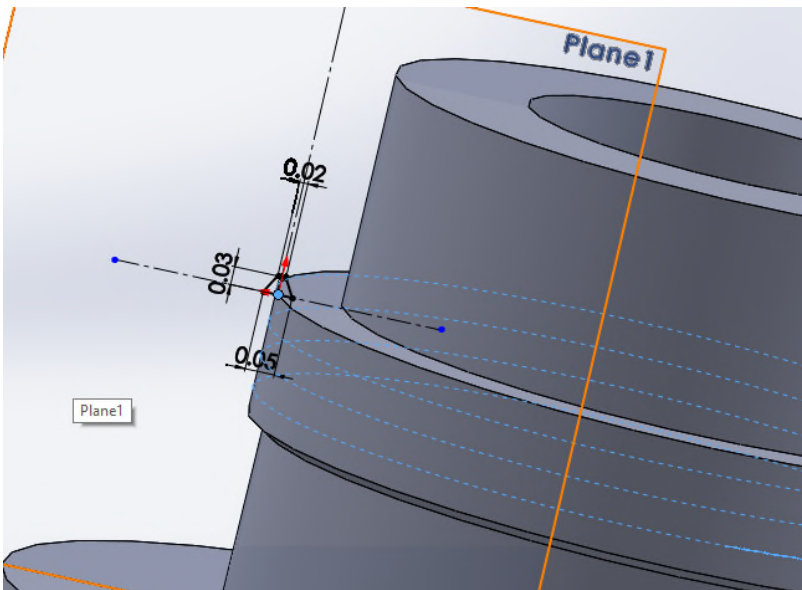
Step 4



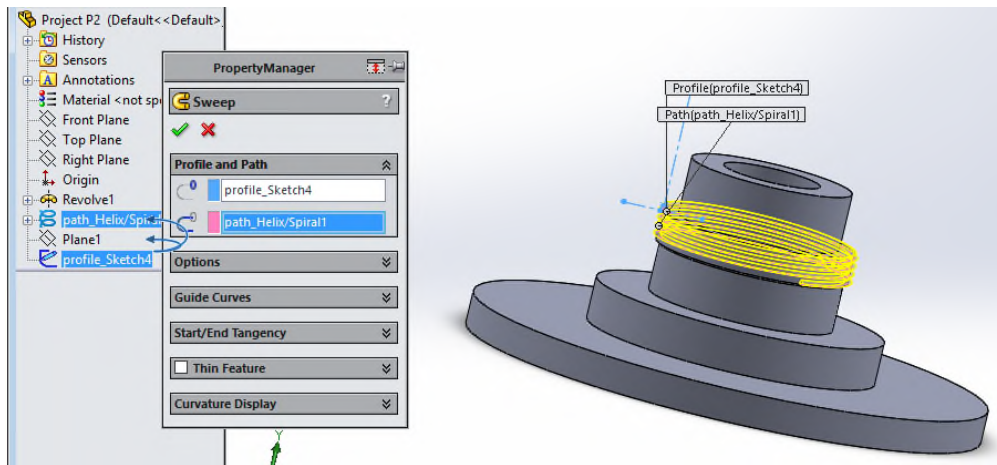
Step 5



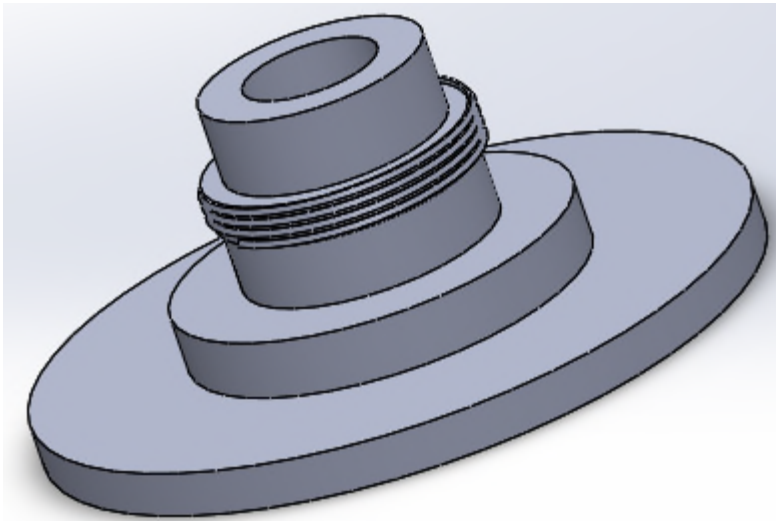
Step 6



Step 7

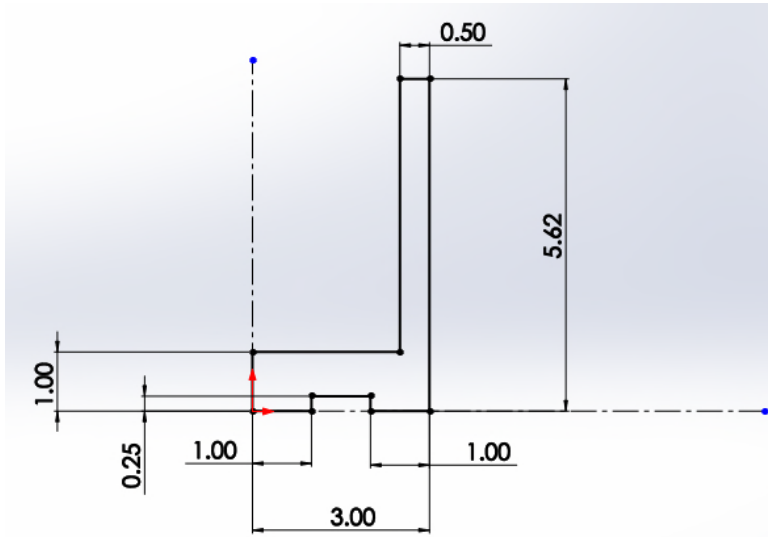


Step 8

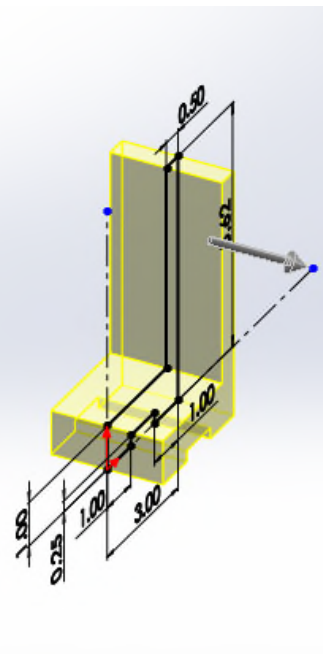
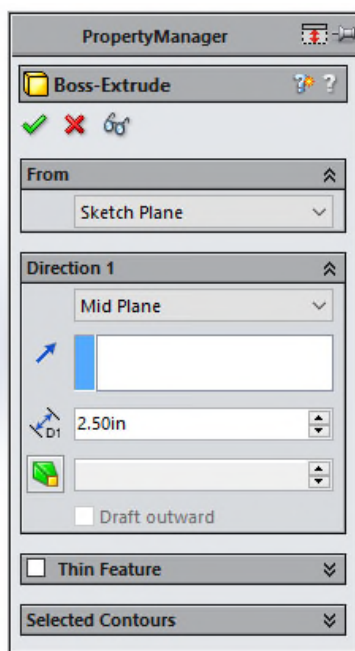


Step 9

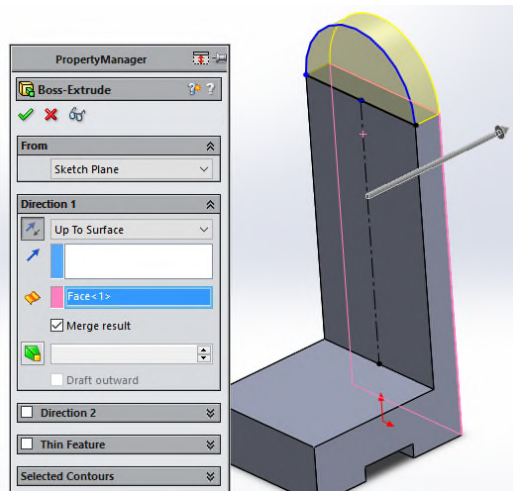
## 5. P2



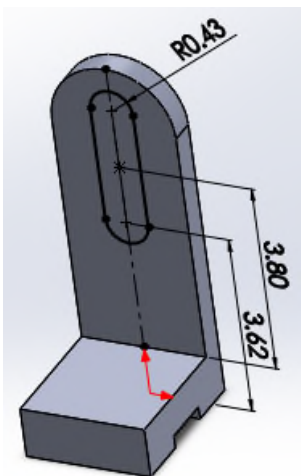
Step 1



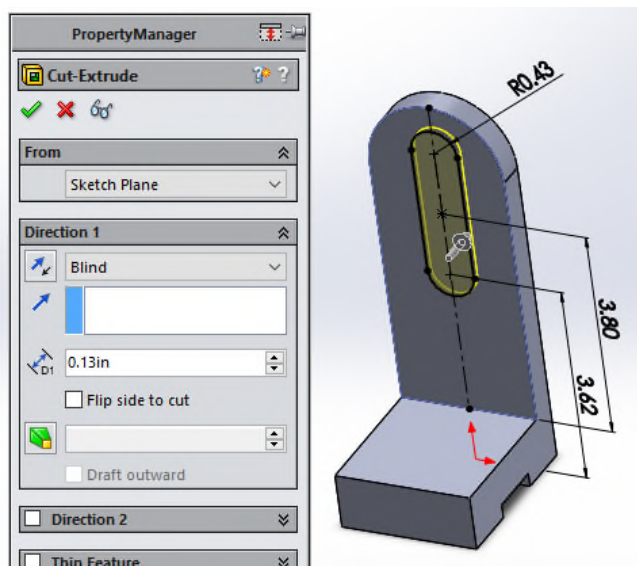
Step 2



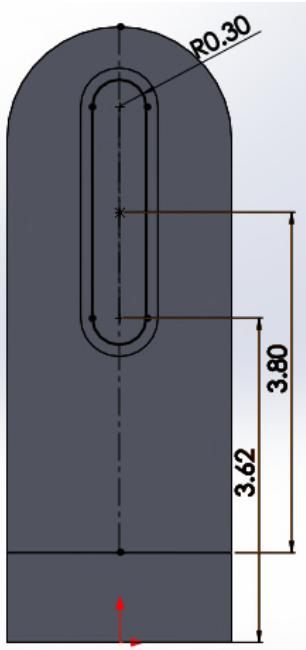
Step 3



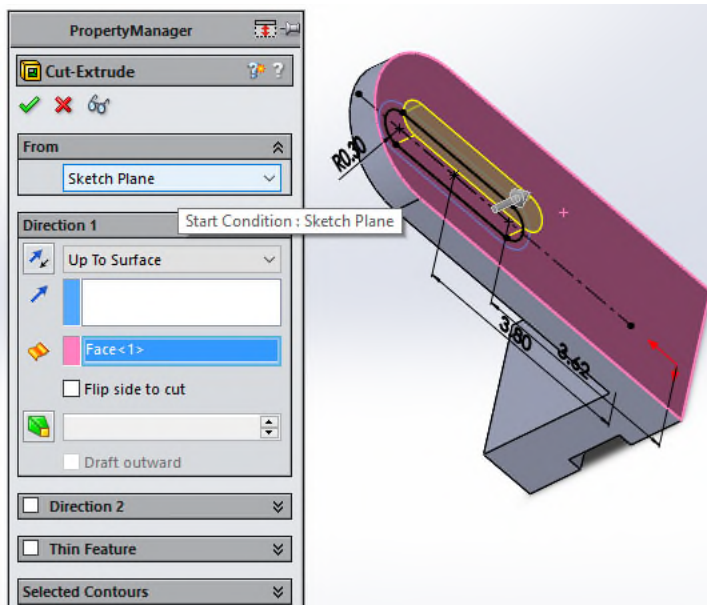
Step 4



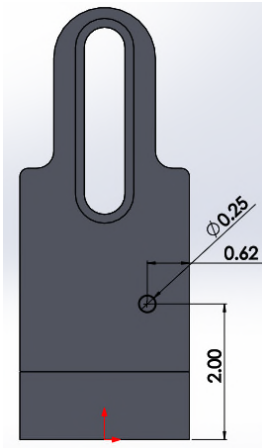
Step 5



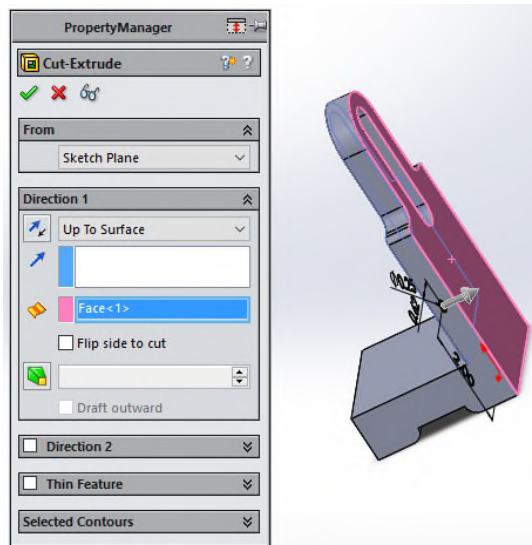
Step 6



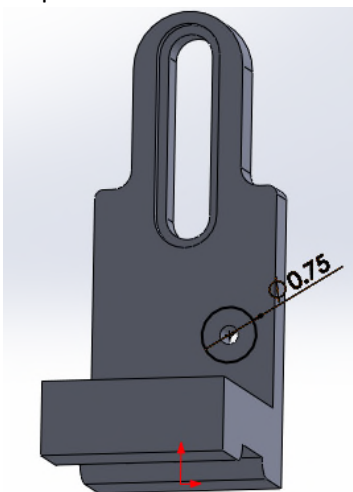
Step 7



Step8

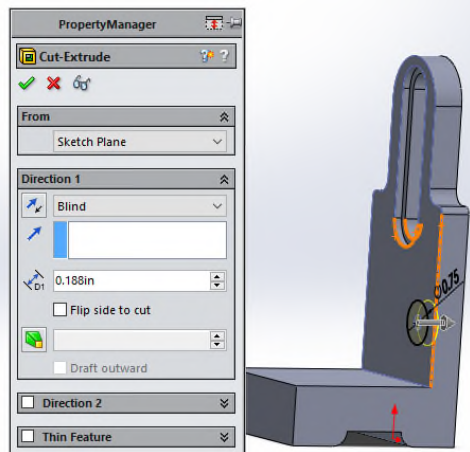


Step9

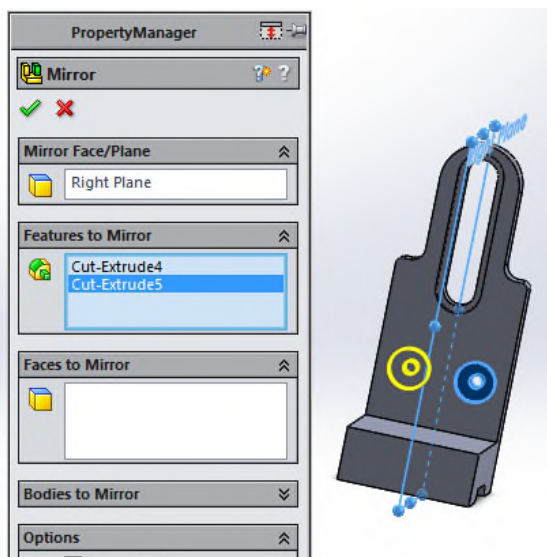


Step10

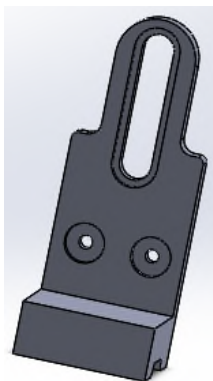




Step 11



Step 12

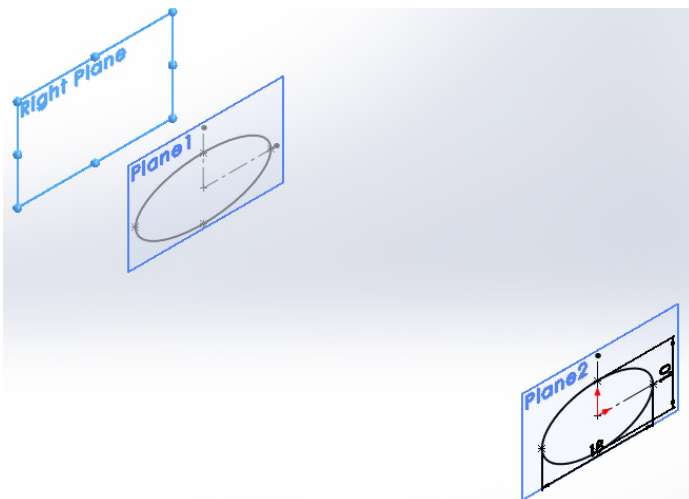


Step 13

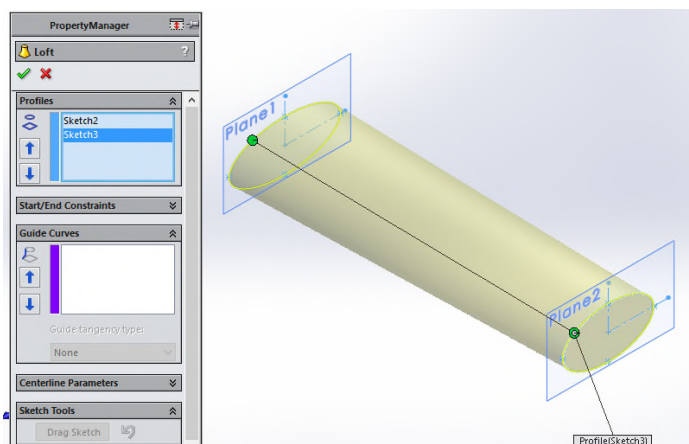


## Chapter 6: Creating Revolved, Swept, and Lofted Parts

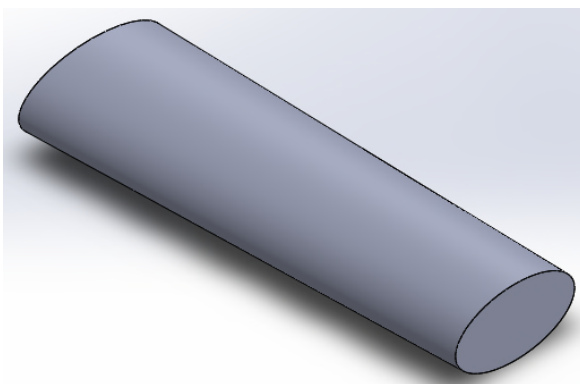
### 1. Problem 6-1



Step 1



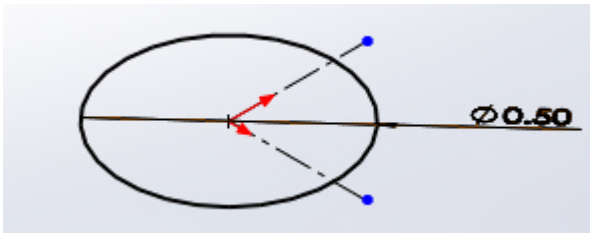
Step 2



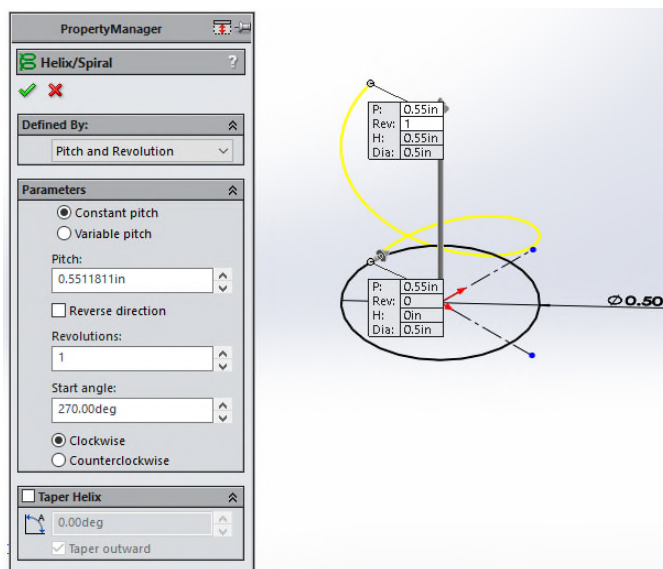
Step 3

Step4: Use Circular Pattern tool to replicate 4 times (see Figure 6-91)

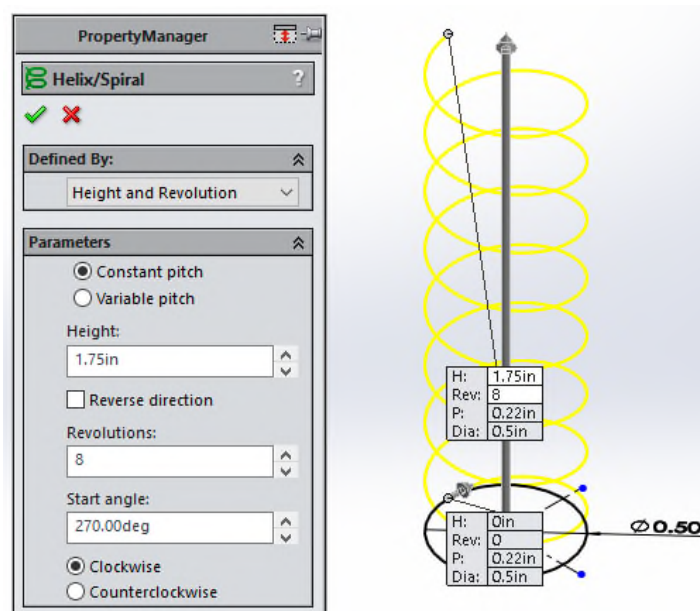
## 2. Problem 6-2



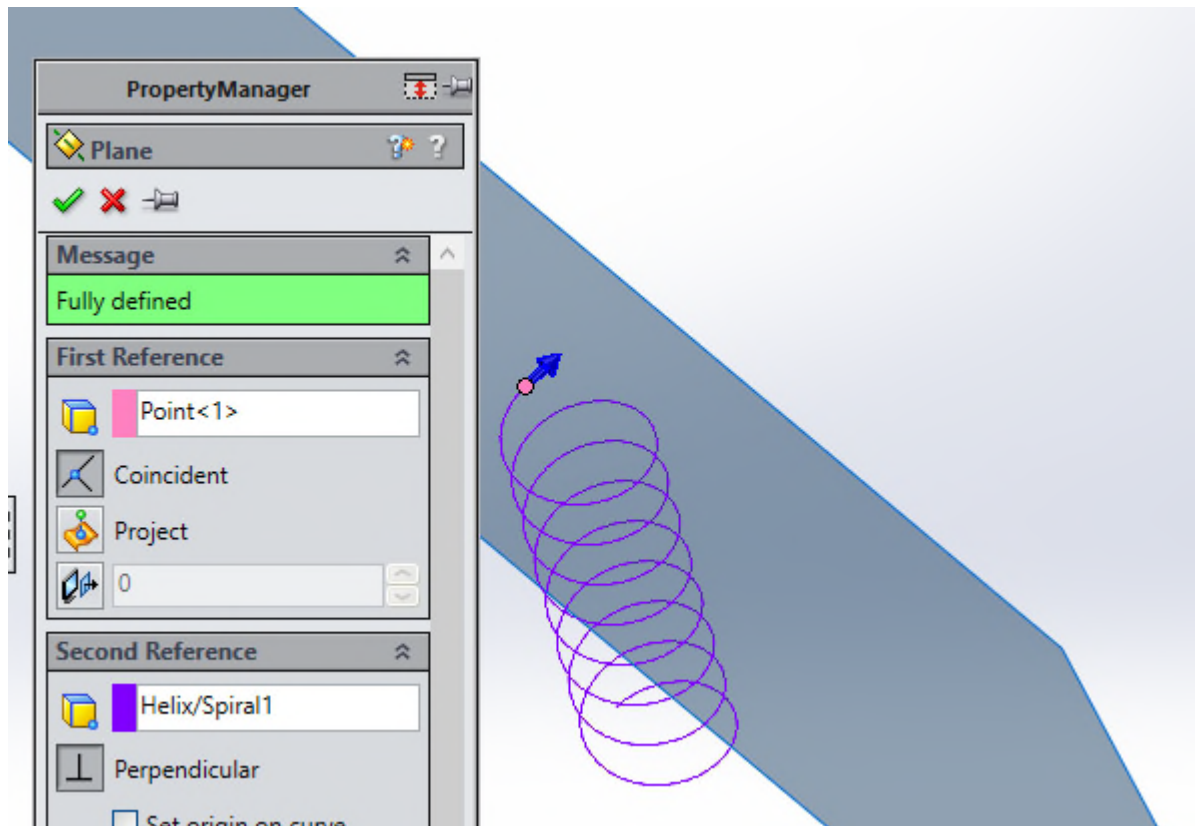
Step 1



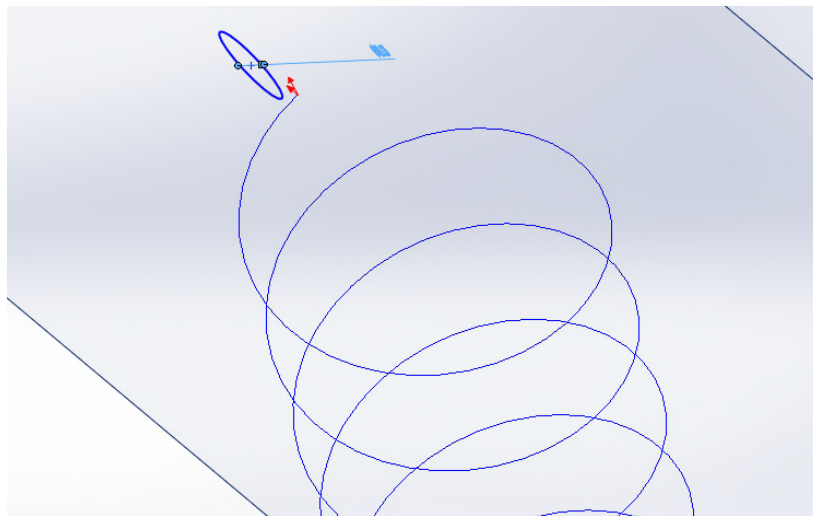
Step 2



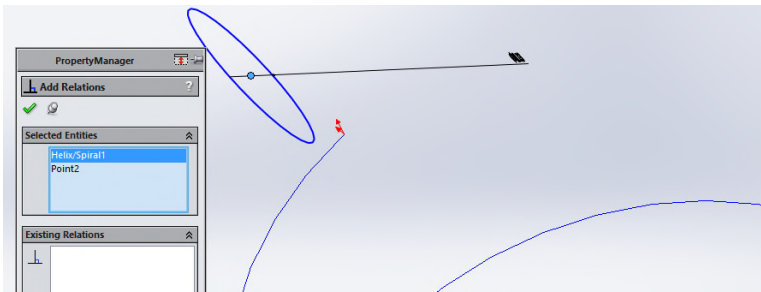
Step 3



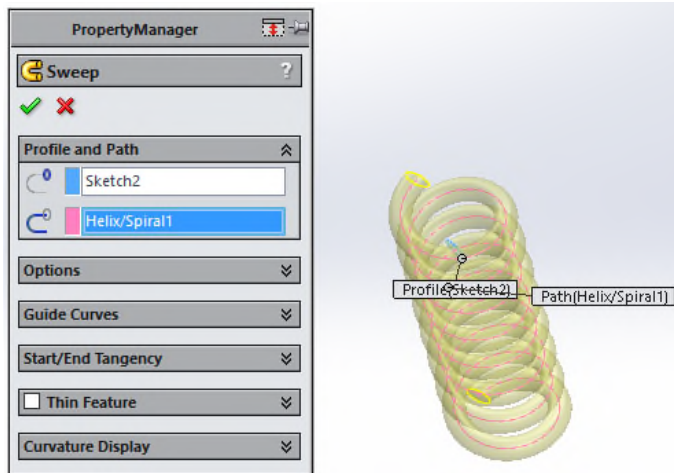
Step 4



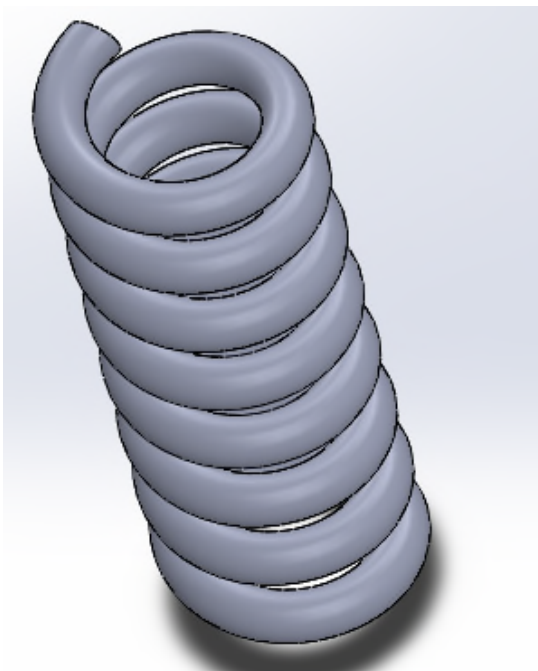
Step 5



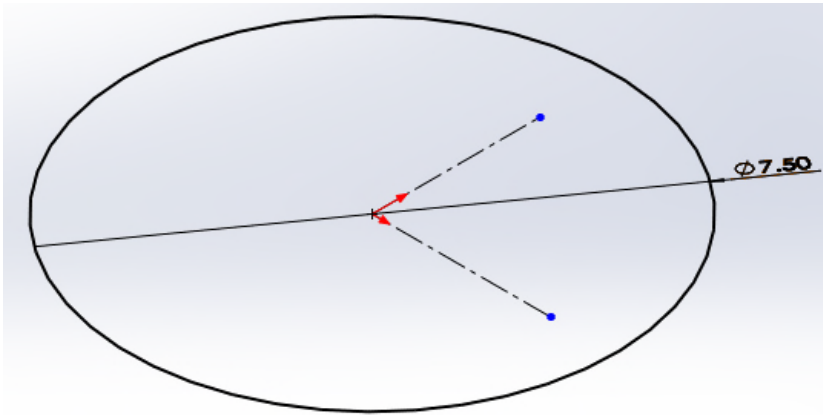
Step 6



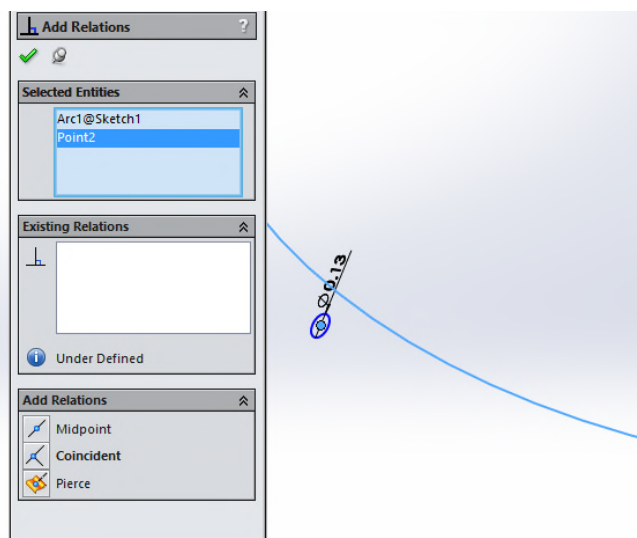
Step 7



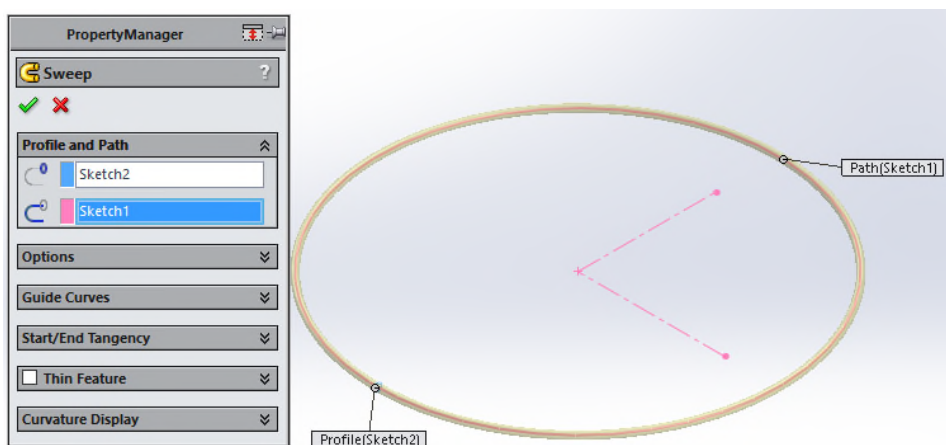
Step 8

**3. Problem 6-3**

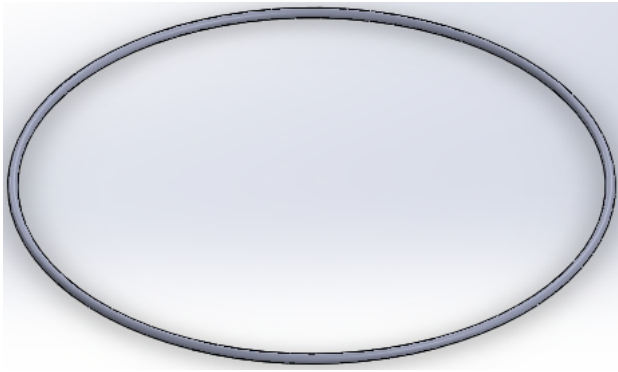
Step 1



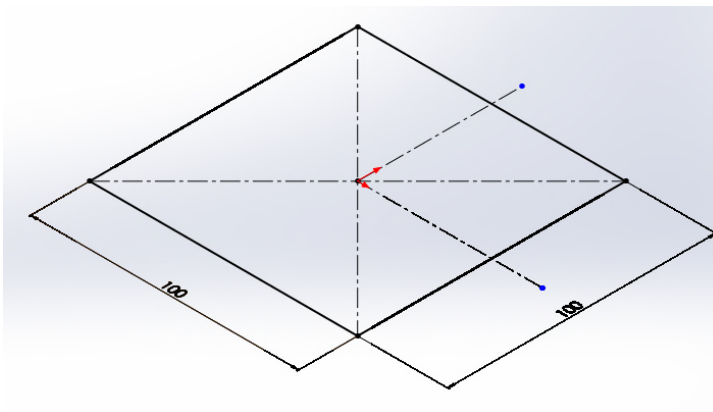
Step 2



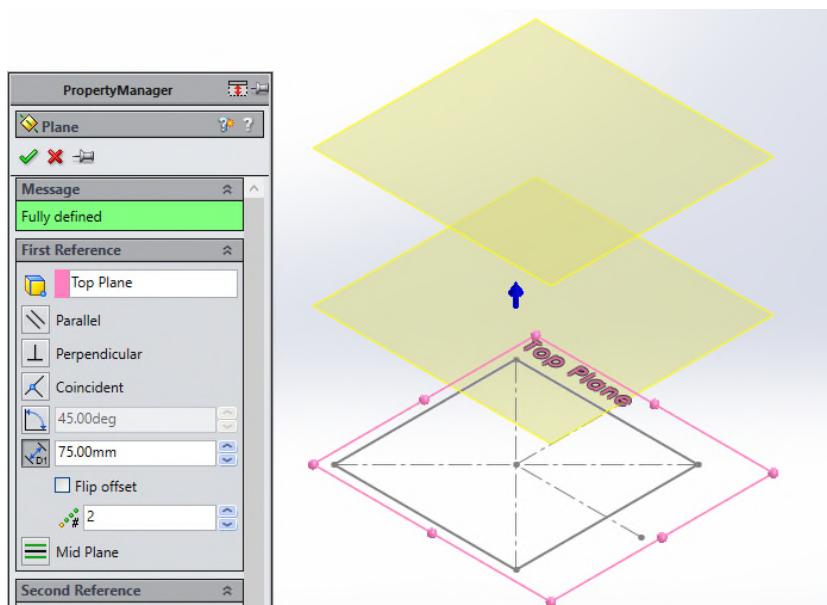
Step 3



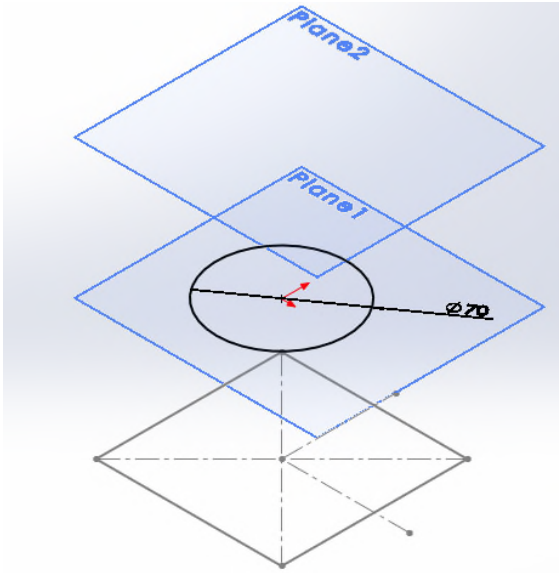
Step 4

**4. Problem 6-4**

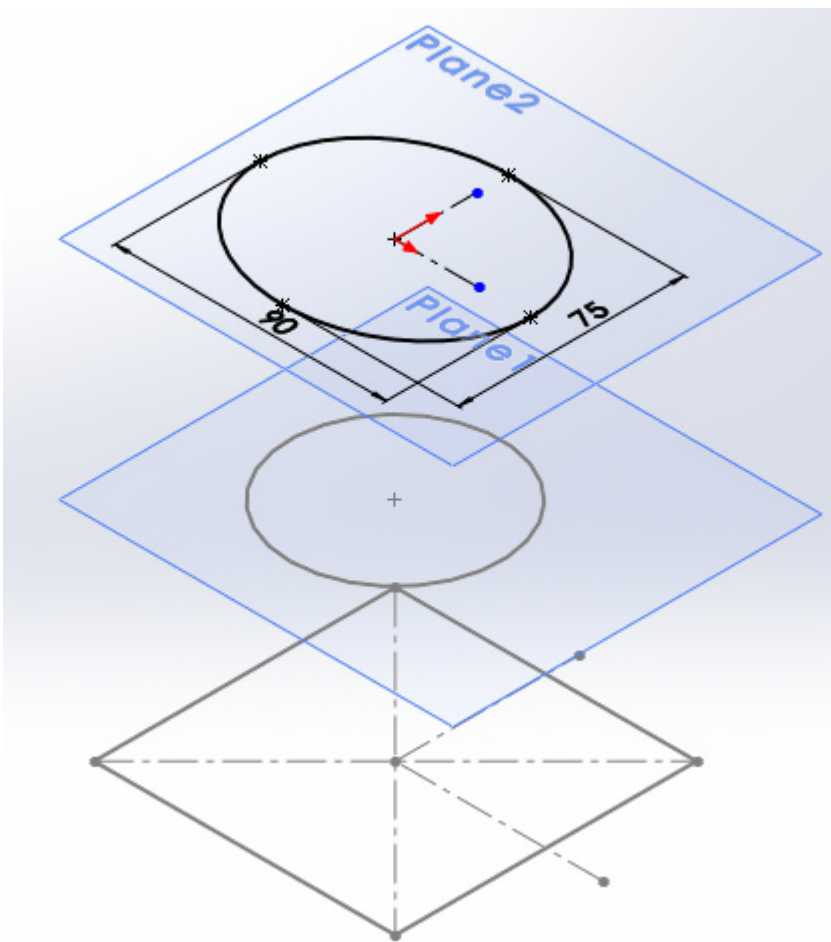
Step 1



Step 2

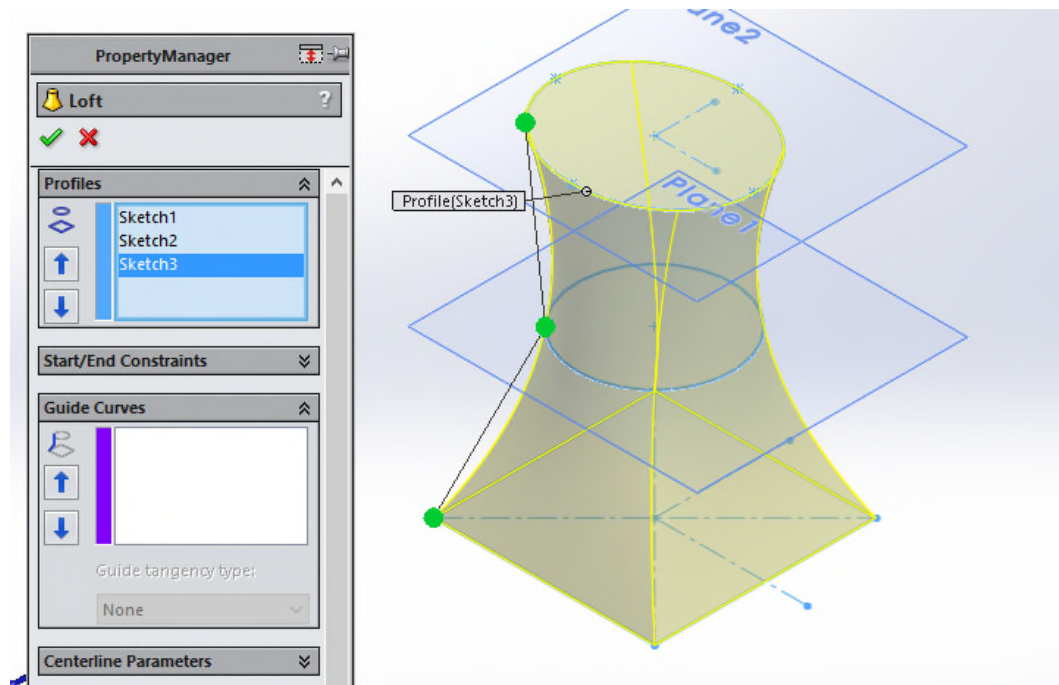


Step 3

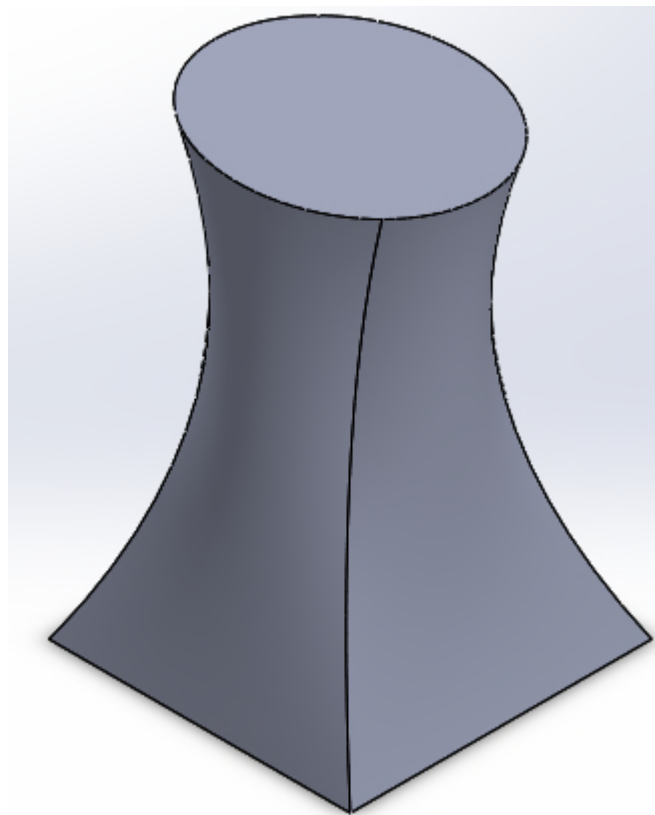


Step 4





Step 5

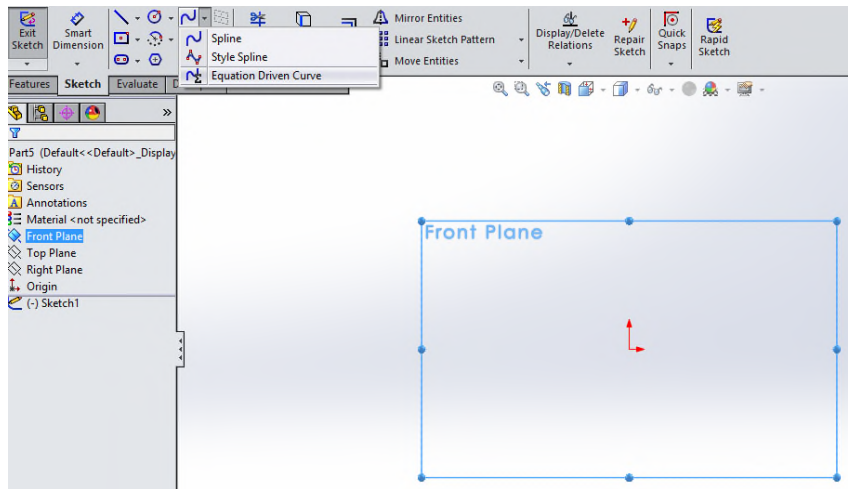


Step 6

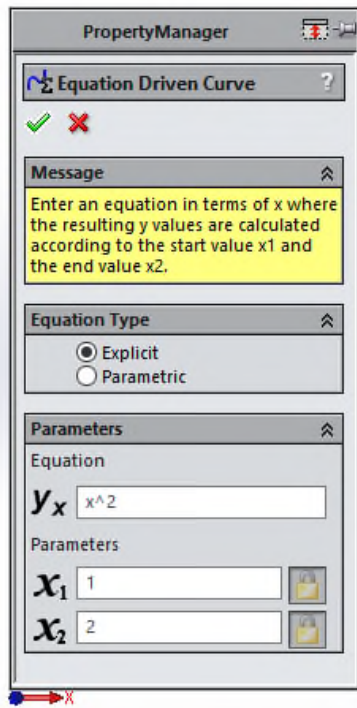


## Chapter 7: Part Modeling with Equation Driven Curves

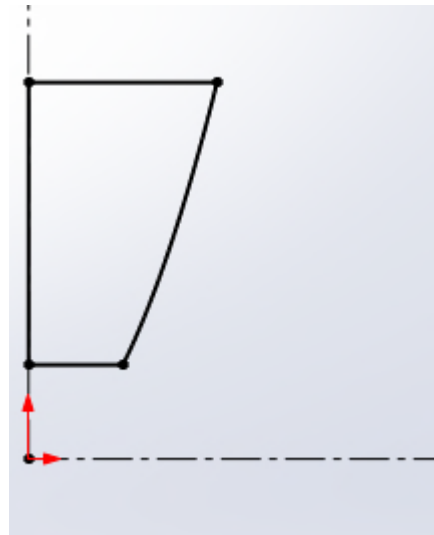
### 1. Problem 7-1



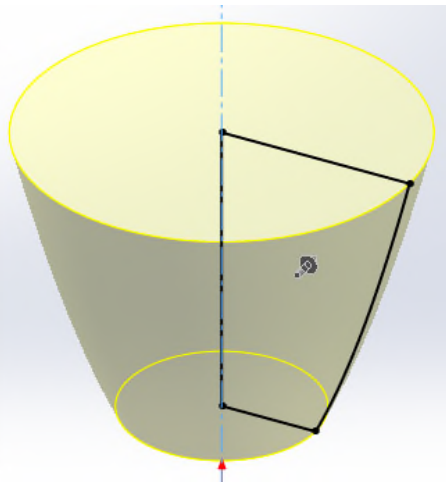
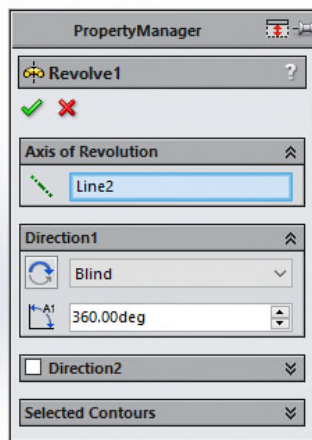
Step 1



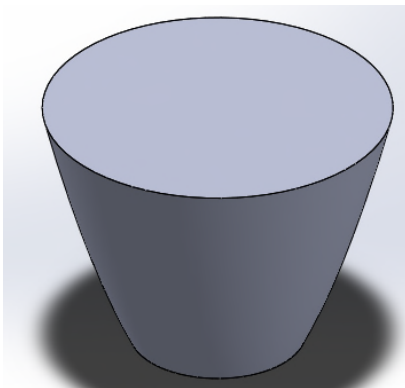
Step 2



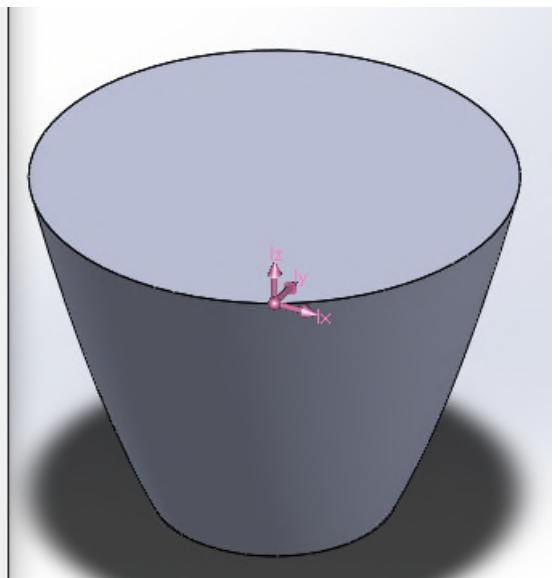
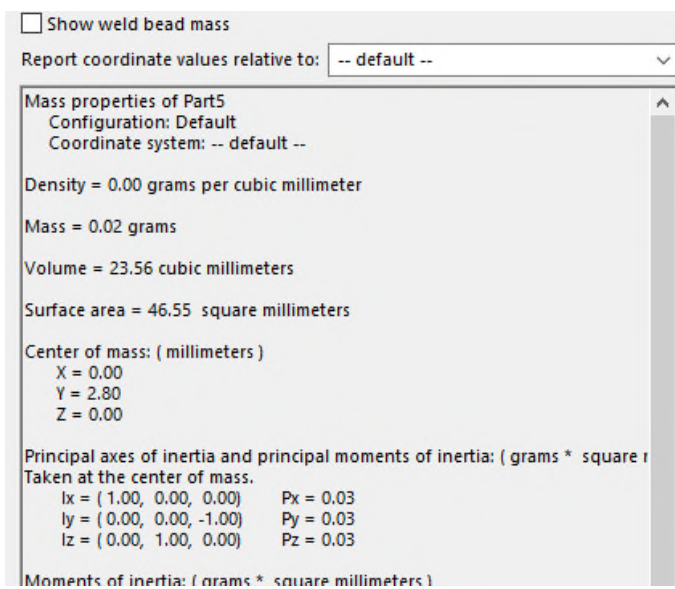
Step 3



Step 4

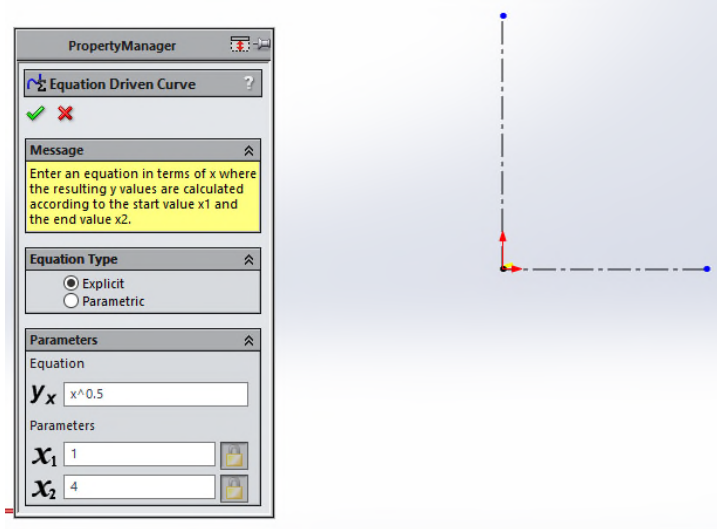


Step 5

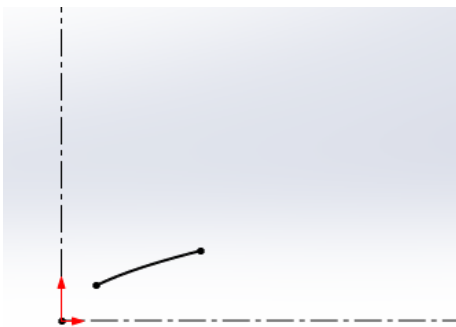


Step 6

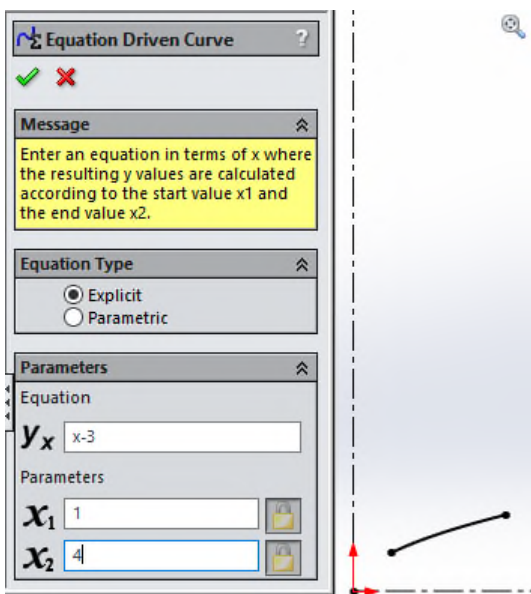
## 2. Problem 7-2



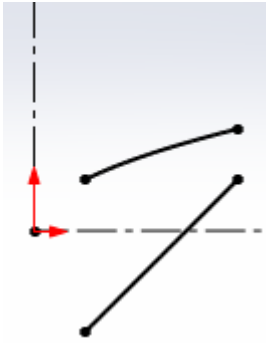
Step 1



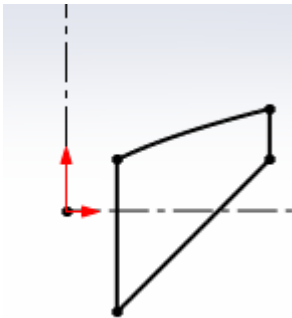
Step 2



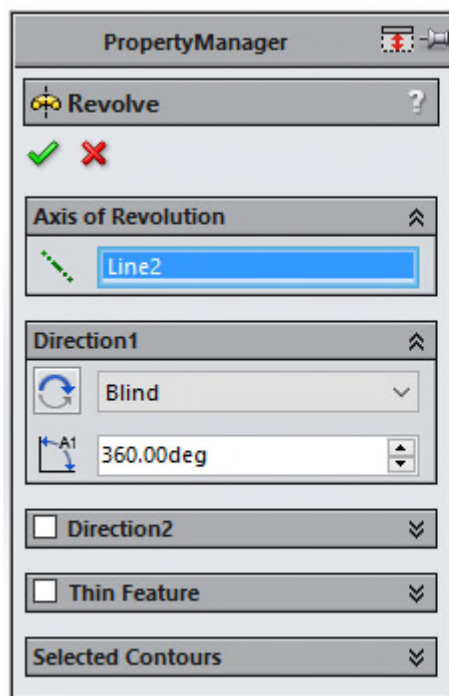
Step 3



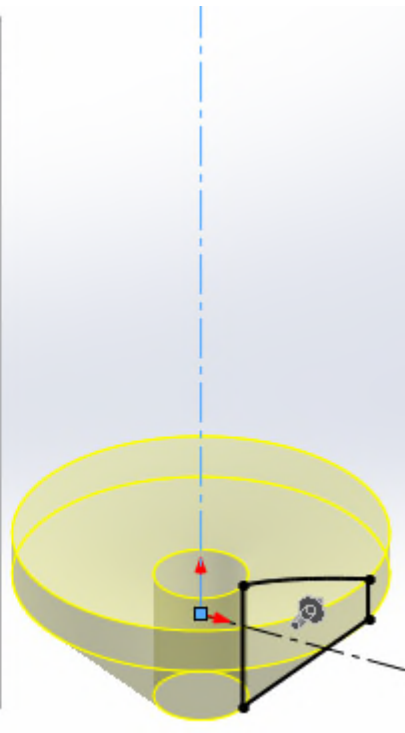
Step 4

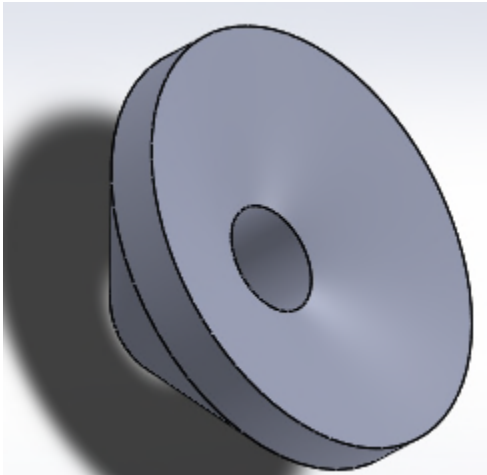


Step 5



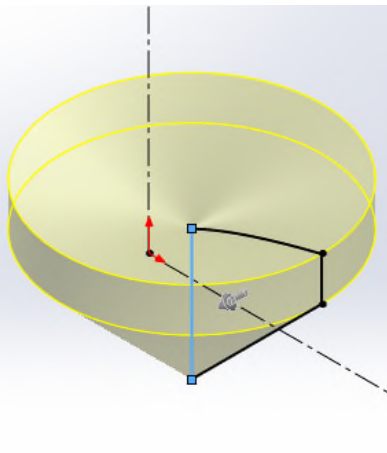
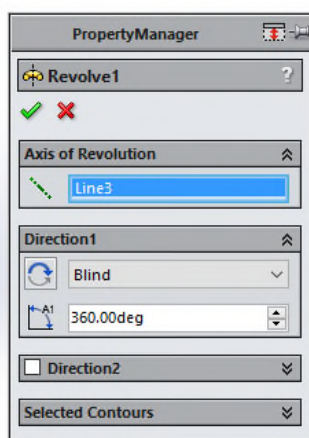
Step 6



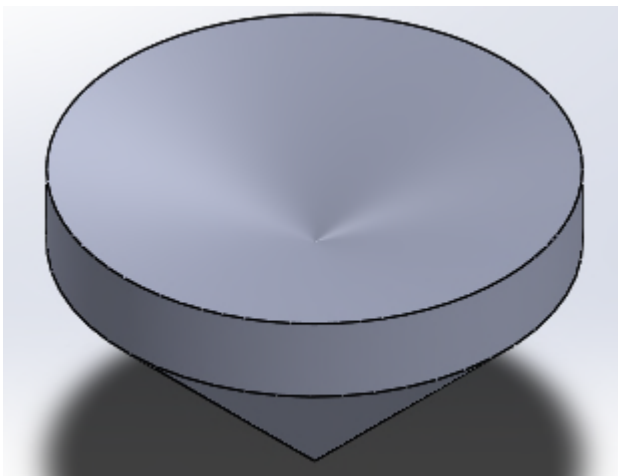


Step 7

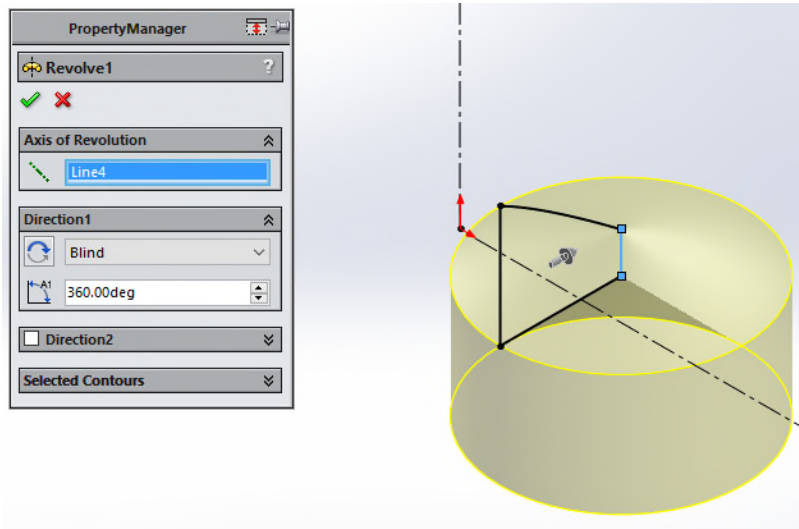
### 3. Problem 7-3



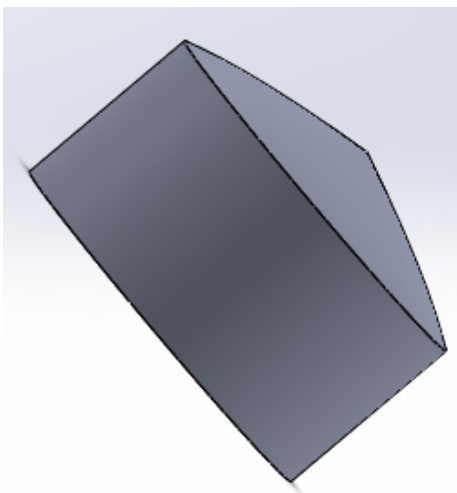
Step 1



Step 2

**4. Problem 7-4**

Step 1



Step 2

**5. Problem 7-5****Question 2**

Volume = 87.36 cubic millimeters

Surface area = 160.04 square millimeters

**Question 3**

Volume = 48.60 cubic millimeters

Surface area = 88.35 square millimeters

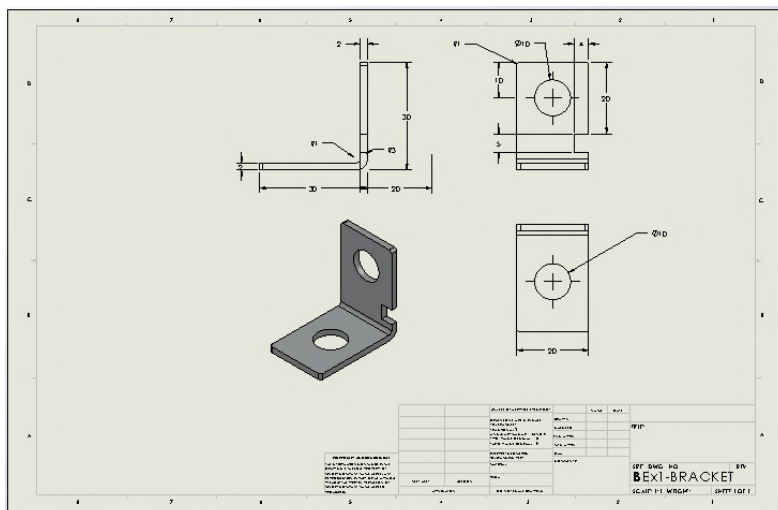
**Question 4**

Volume = 67.64 cubic millimeters

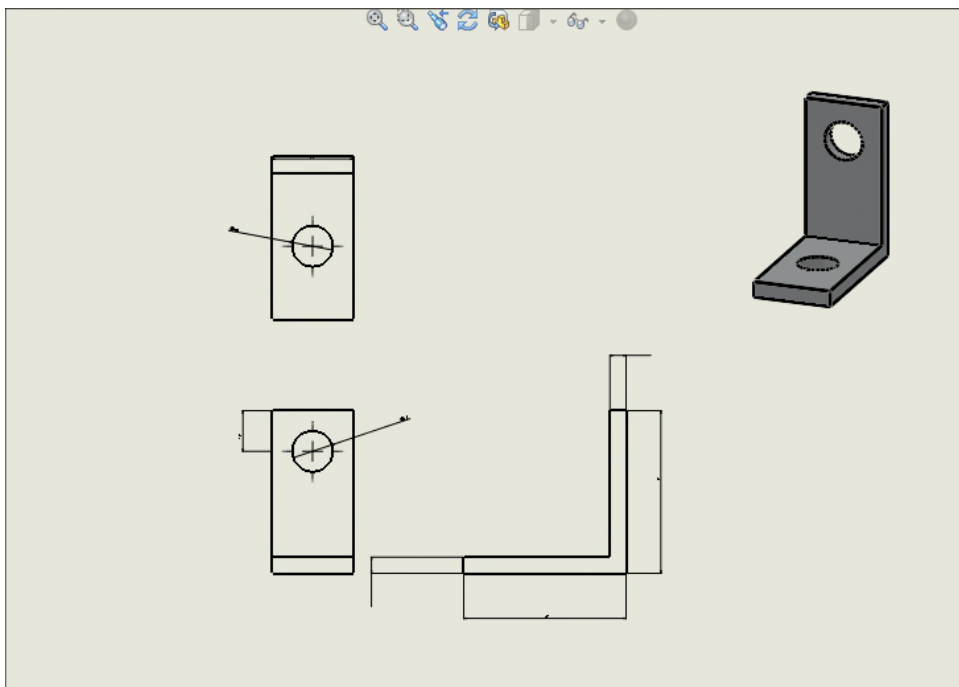
Surface area = 126.73 square millimeters

## Chapter 9: Part and Assembly Drawings—CSWA Preparations

### 1. Problem 9-1

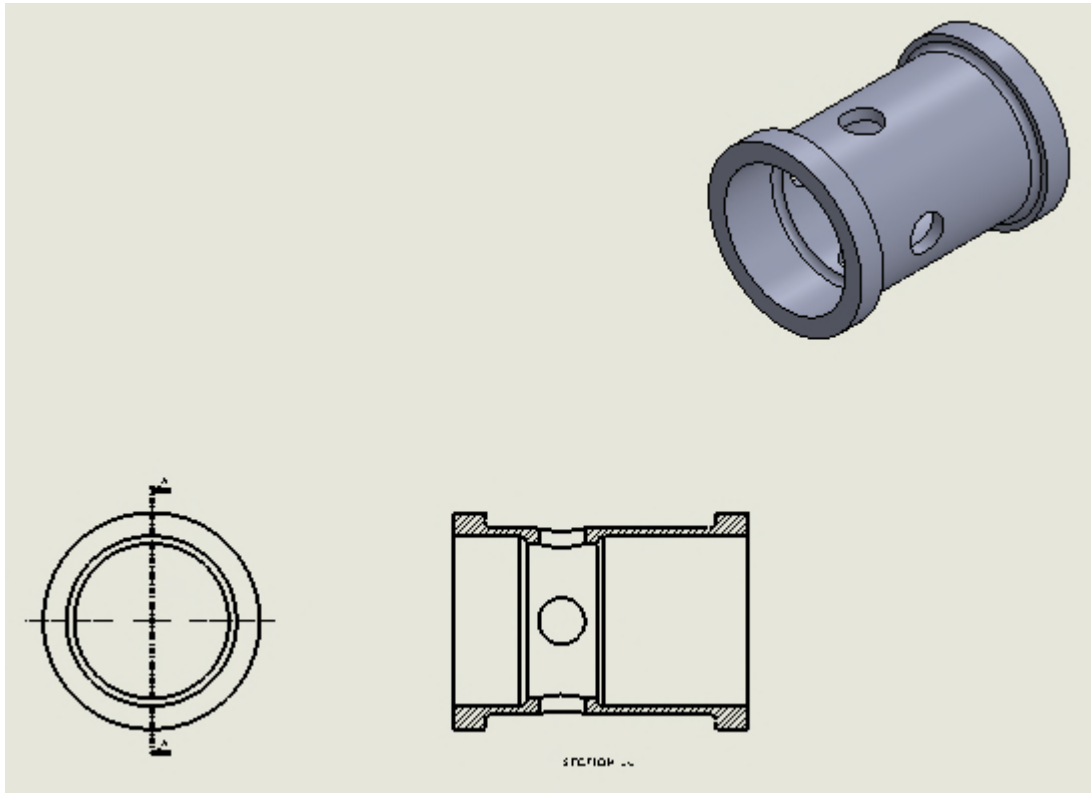
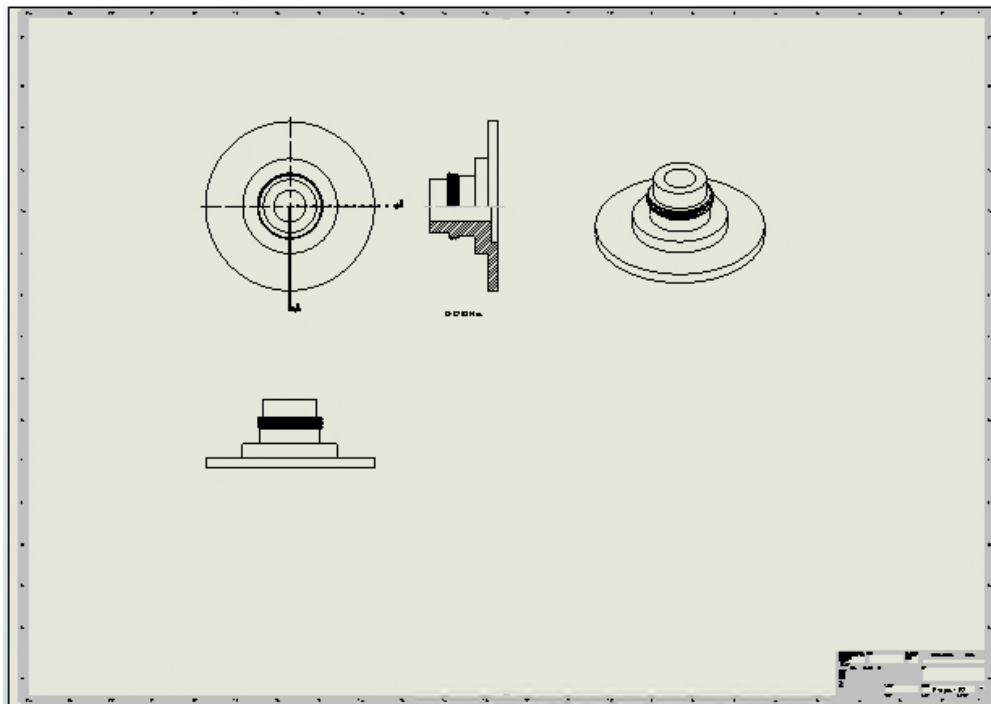


### 2. Problem 9-2



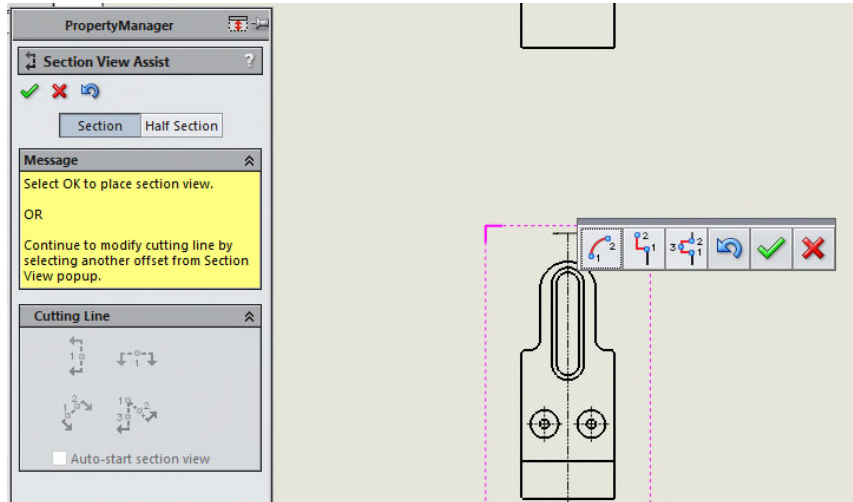
### 3. Problem 9-3

The views are all shown in the chapter.

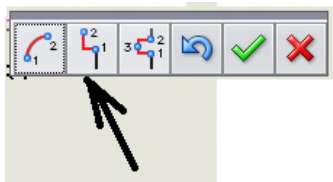
**4. Project P1****5. Project P2**



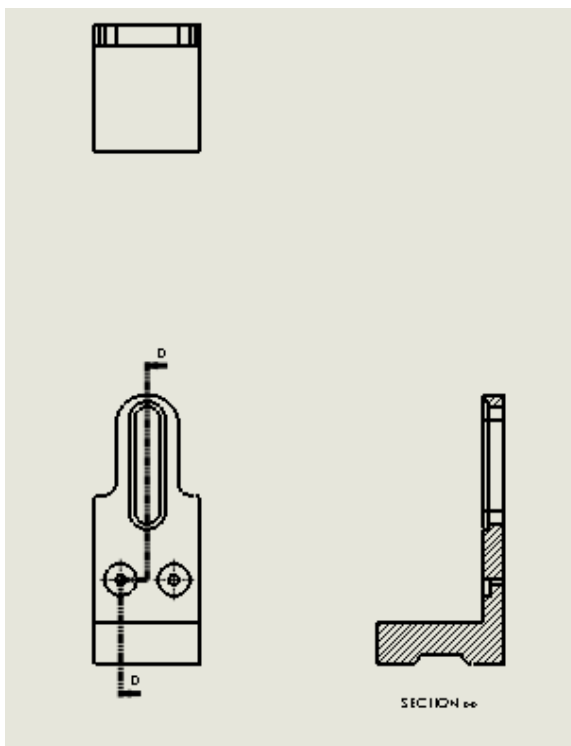
## 6. Project P3



Step 1



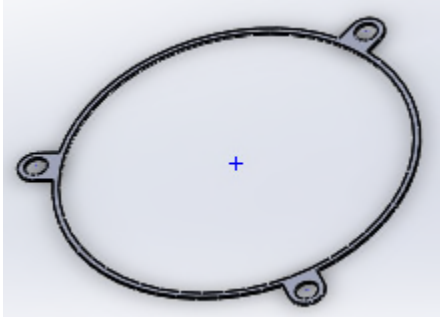
Step 2: Select the option pointed to, and click center of left circle(s)



Step 3

## Chapter 11: Top-Down Design

### 1. Problem 11-1



Shape follows the solution given

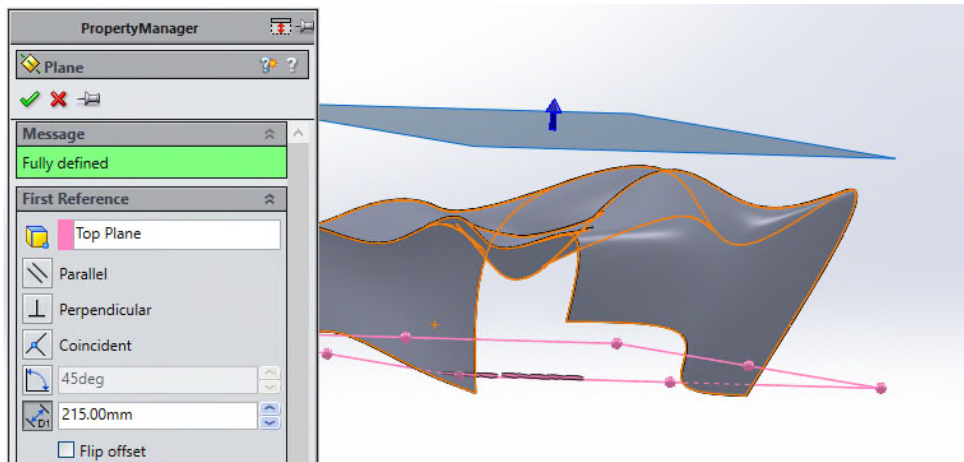
### 2. Problem 11-2



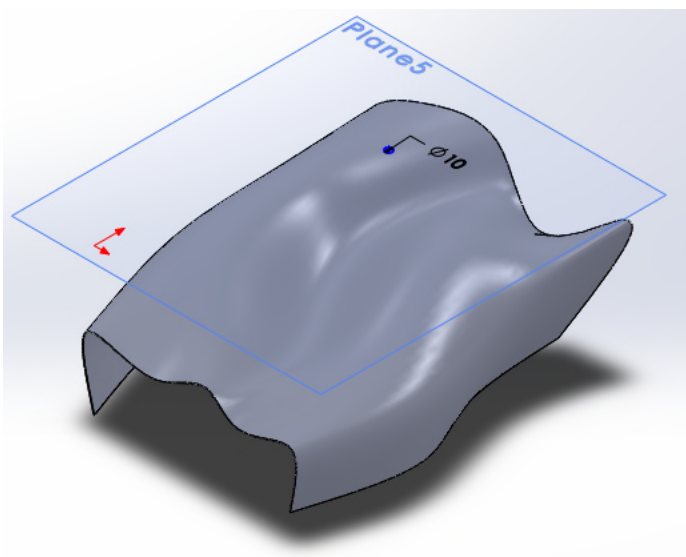
Shape follows the solution given

## Chapter 12: Surface Modeling

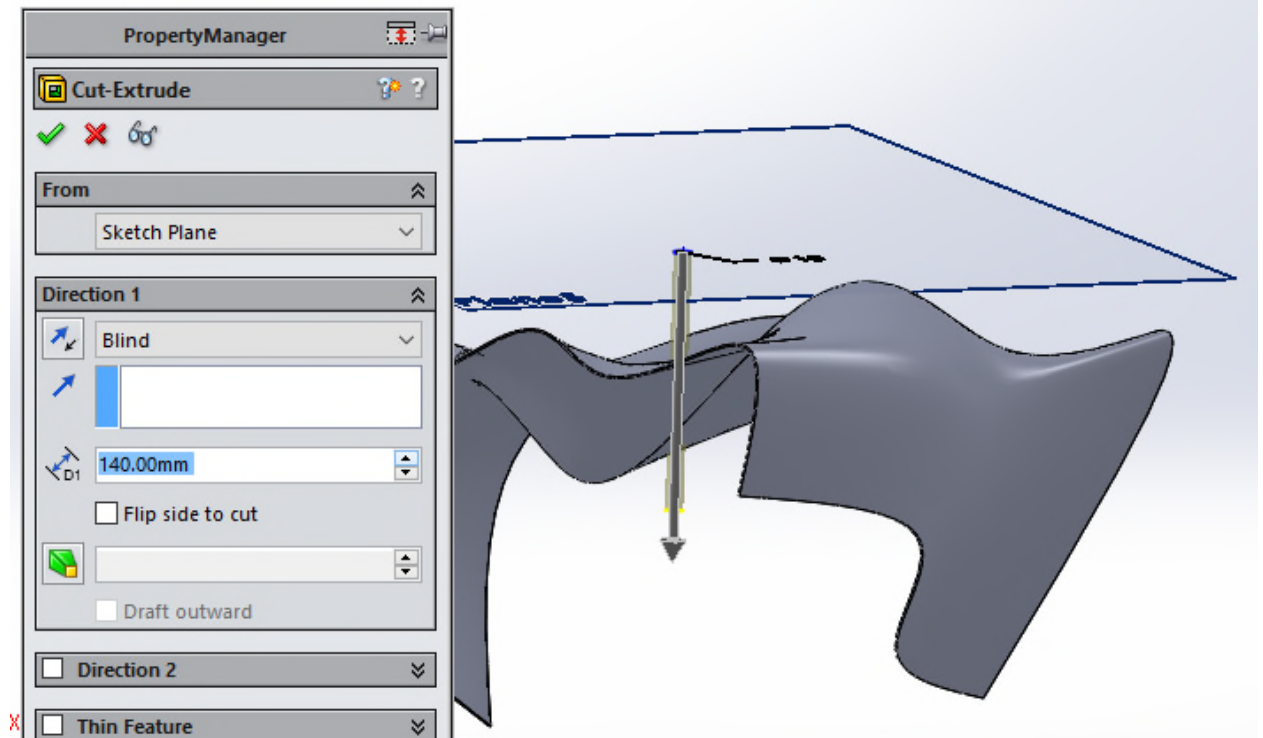
### 1. Problem 12-1



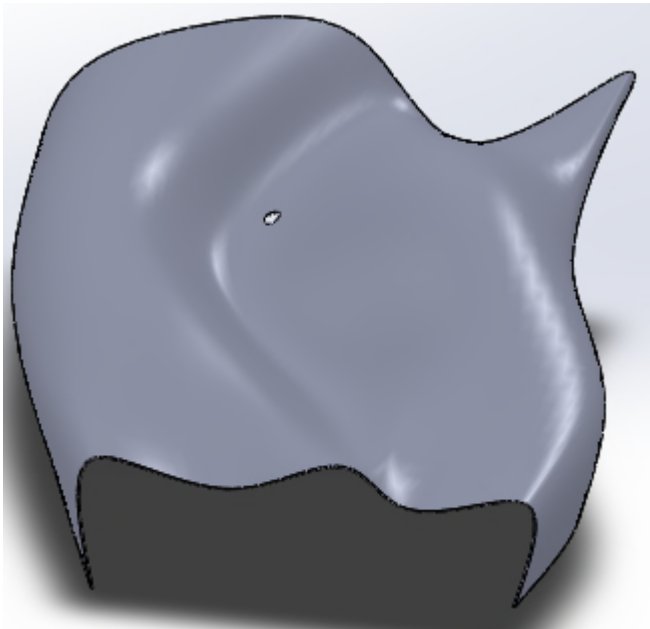
Step 1



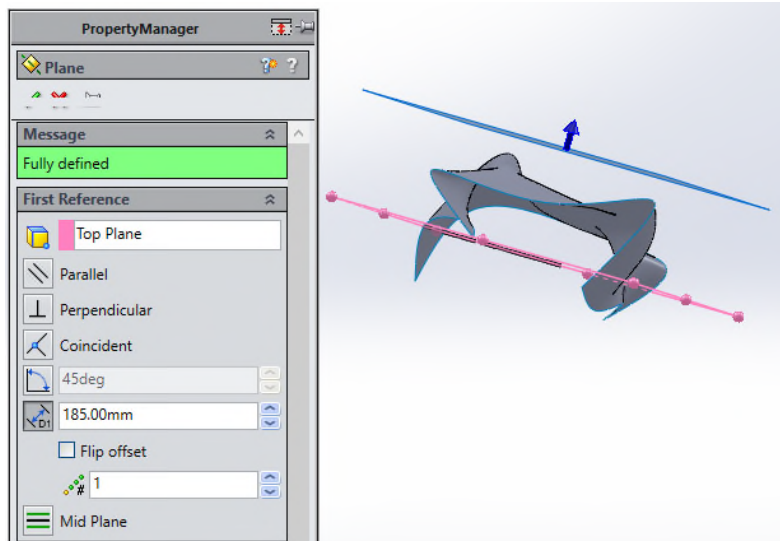
Step 2



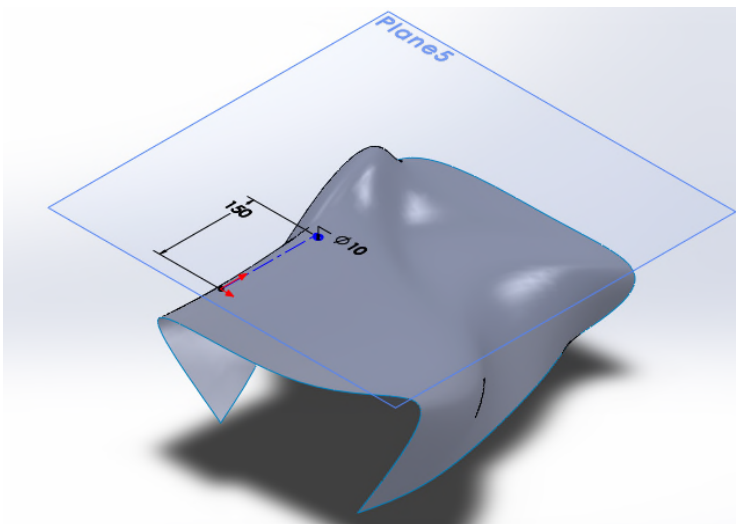
Step 3



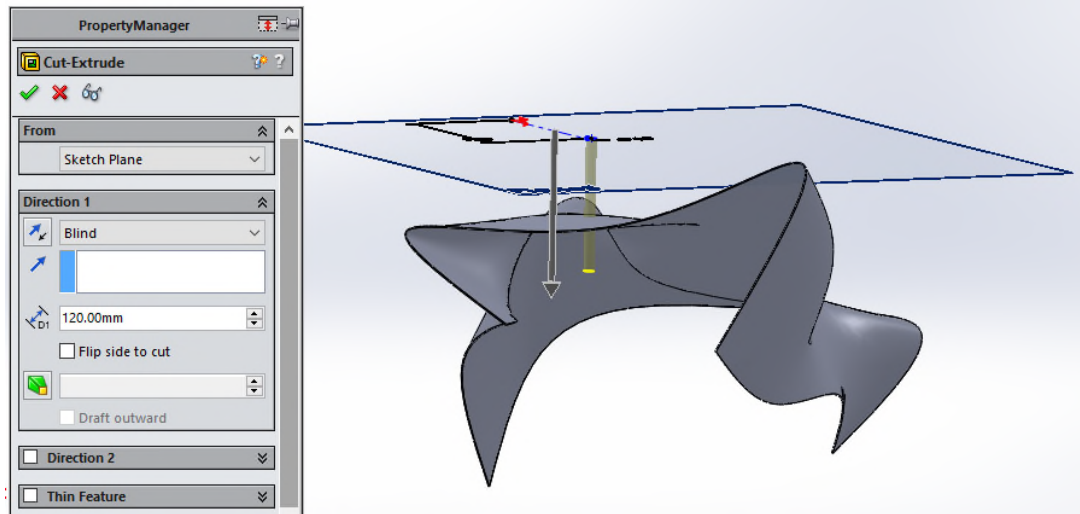
Step 4

**2. Problem 12-2**

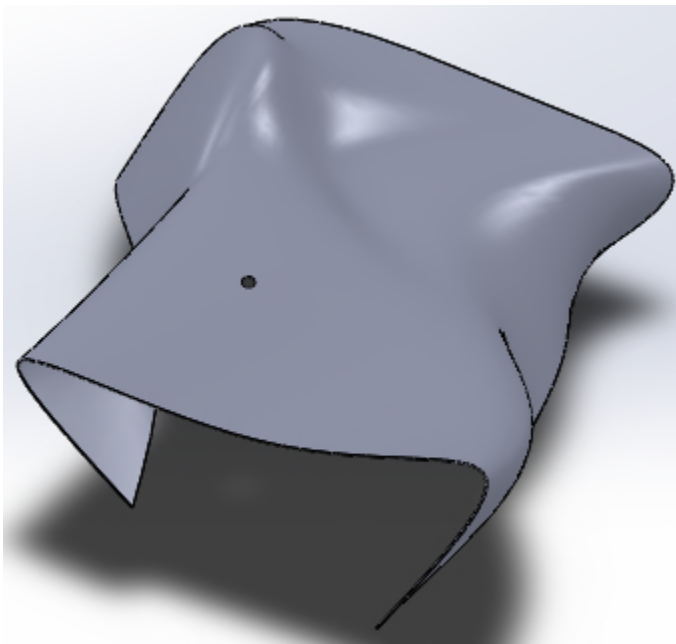
Step 1



Step 2



Step 3



Step 4

### 3. Problem 12-3

Used for patching surfaces

## **Chapter 13: Tool Boxes and Design Libraries**

Projects 1—6 are to be carried out as projects based on the content of chapter 13

## **Chapter 15: Tool Boxes and Design Libraries**

Projects 1—6 are to be carried out as projects based on the content of chapter 13

### **1. Problem 15-1**

Basic motion uses motors, springs, 3D contacts, and gravity (Physical Simulation); it does not use frames. Motion analysis is an Add-In to SolidWorks and it is the highest level of motion study.

### **2. Problem 15-2**

No

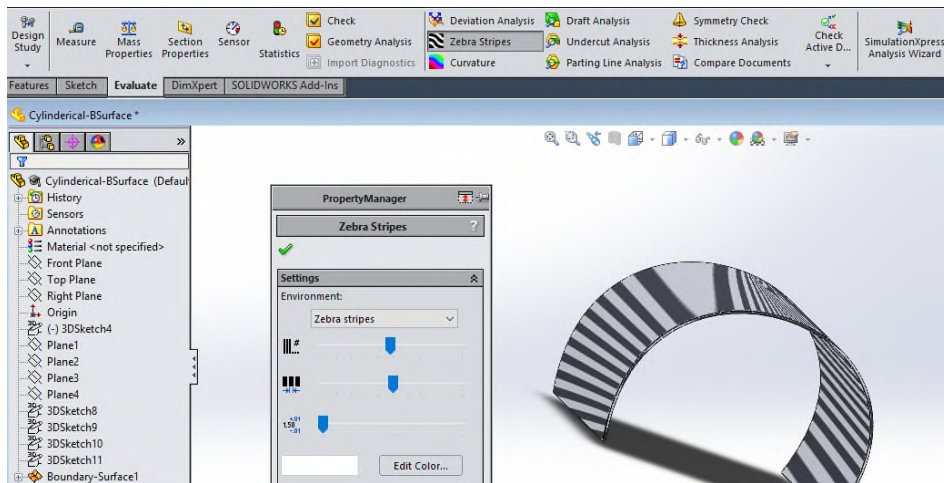
### **3. Problem 15-3**

No

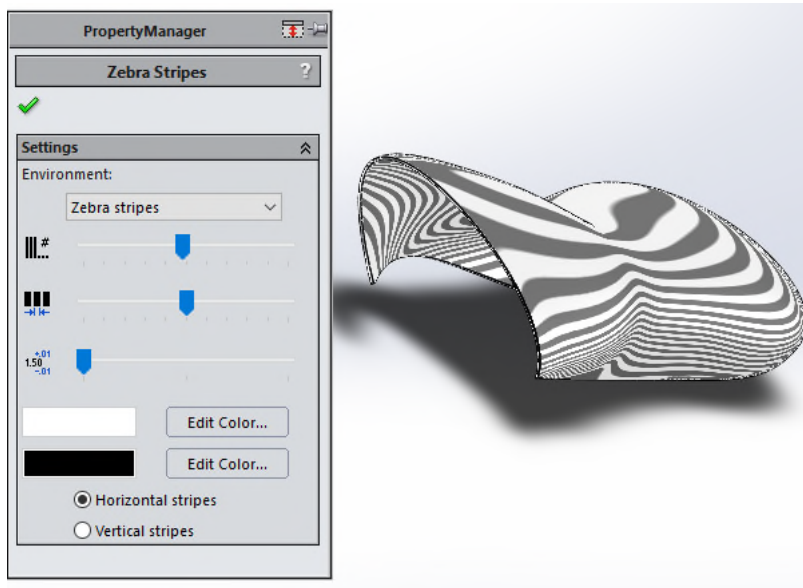


## Chapter 16: Rendering

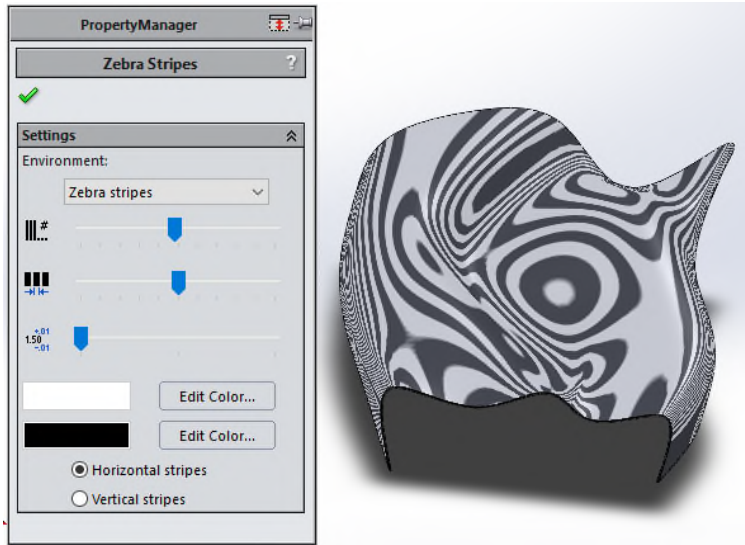
### 1. Problem 16-1



### 2. Problem 16-2

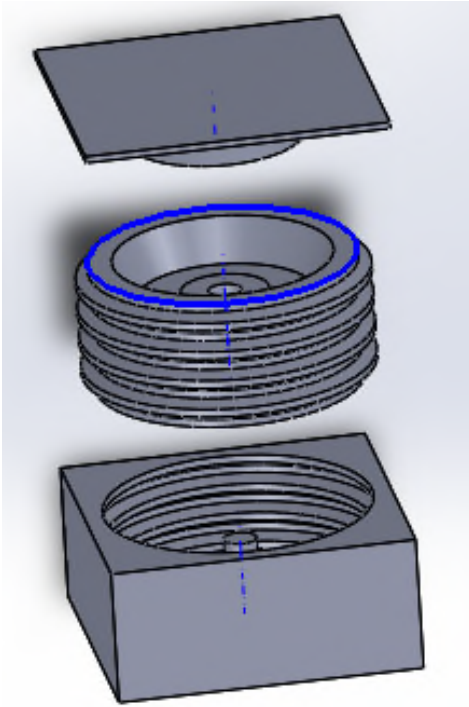


### 3. Problem 16-3

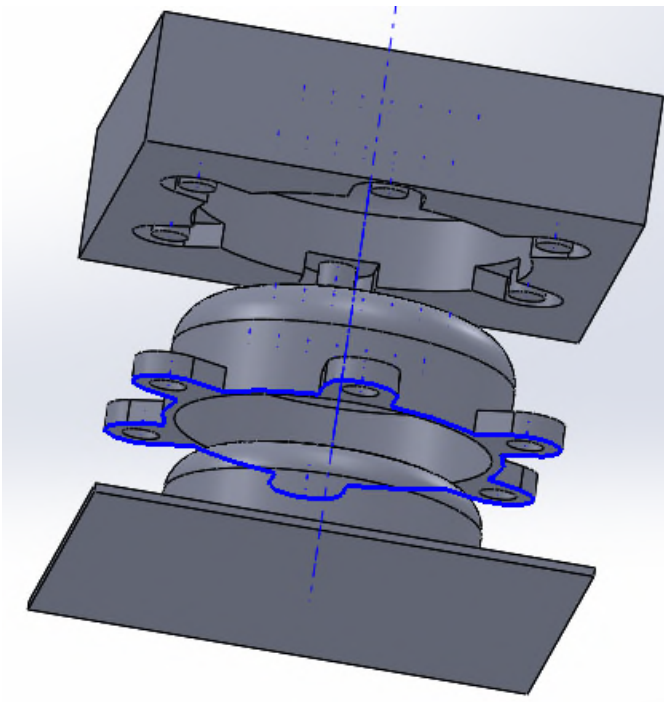


## Chapter 17: Mold Design

### 1. Problem 17-1

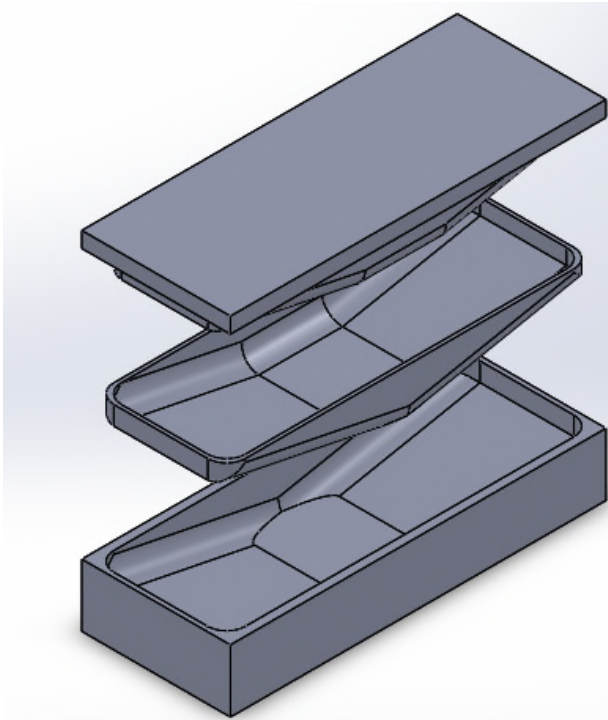


### 2. Problem 17-2



**3. Problem 17-3**

**4. Problem 17-4**



## Chapter 18: Sheet Metal Parts—I

### 1. Problem 18-1

Repeat problem

### 2. Problem 18-2

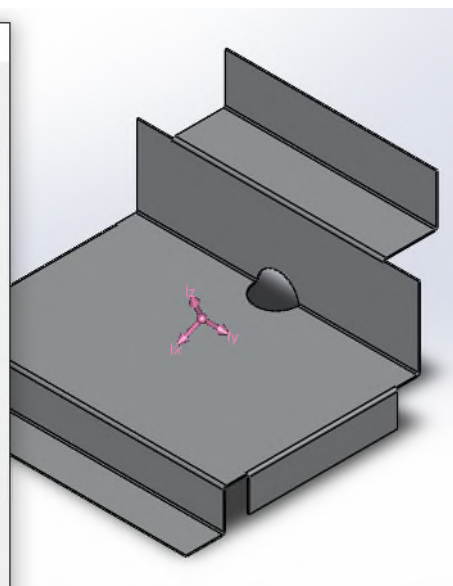
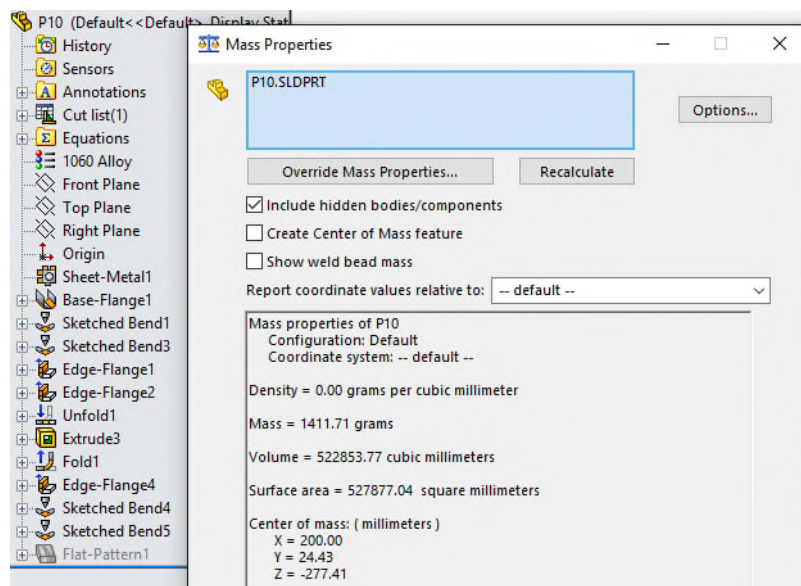
Repeat problem

### 3. Problem 18-3

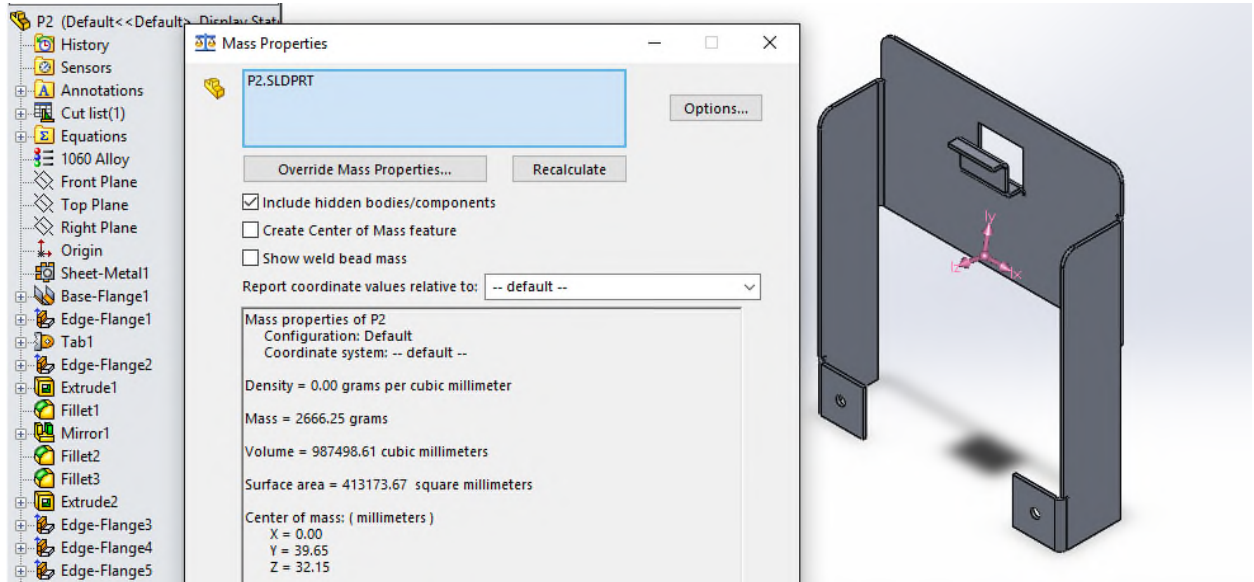
Repeat problem

## Chapter 19: Sheet Metal Parts—II

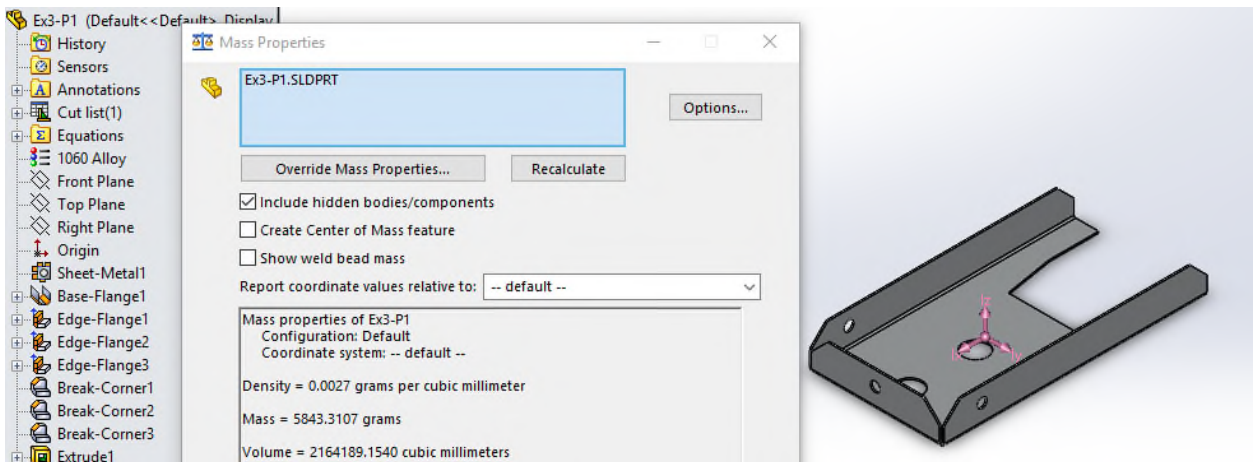
### 1. Problem 19-1



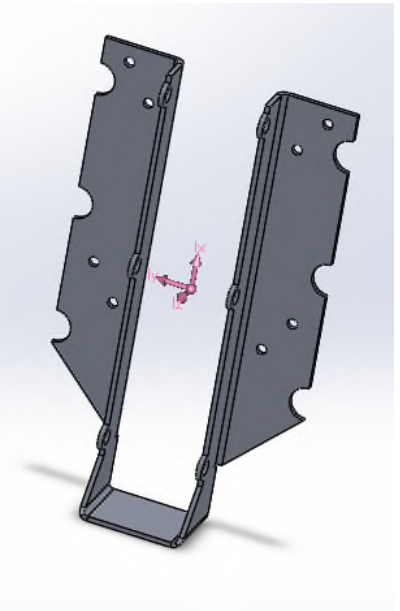
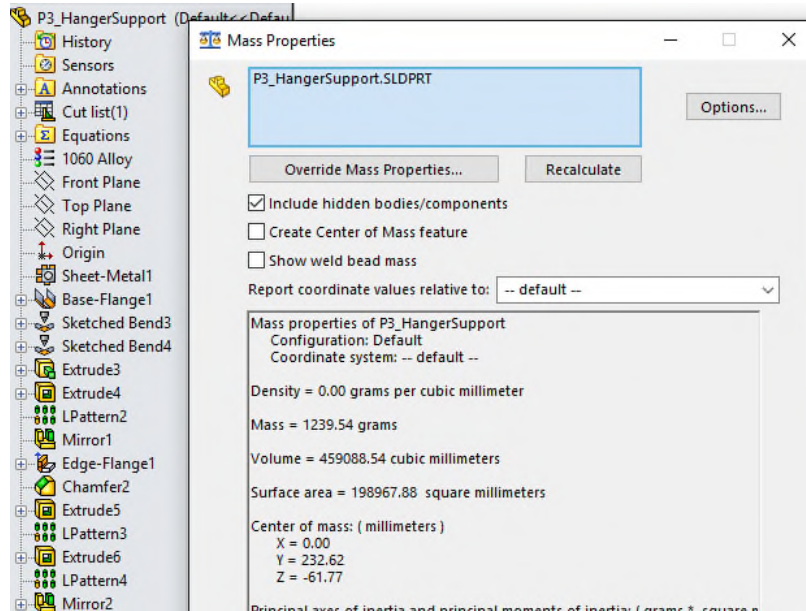
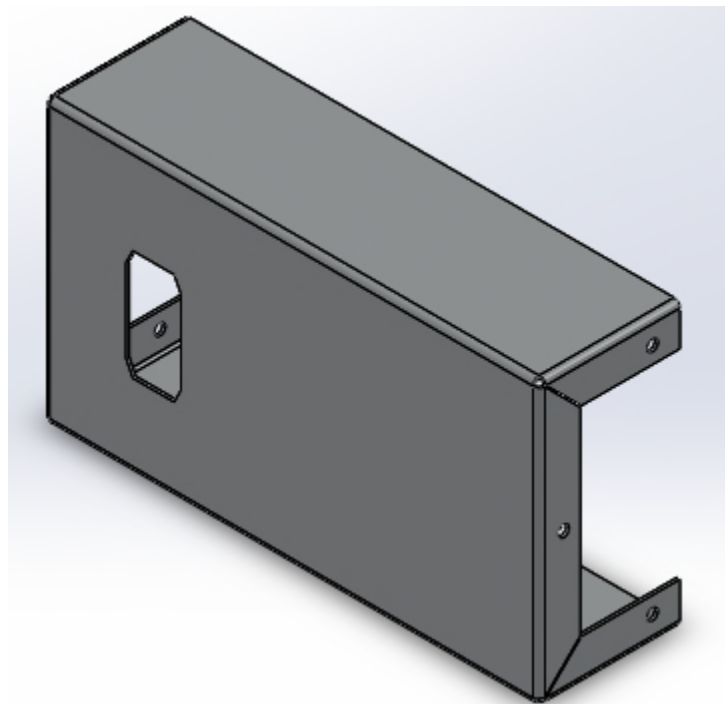
## 2. Problem 19-2



## 3. Problem 19-3





**4. Problem 19-4****5. Problem 19-5**

## **Chapter 20: Weldments**

# 1—9 are to be carried out as projects based on the content of chapter 20

## **Chapter 22: Power Transmission Elements**

Projects 1—3 are to be carried out as projects based on the content of chapter 22

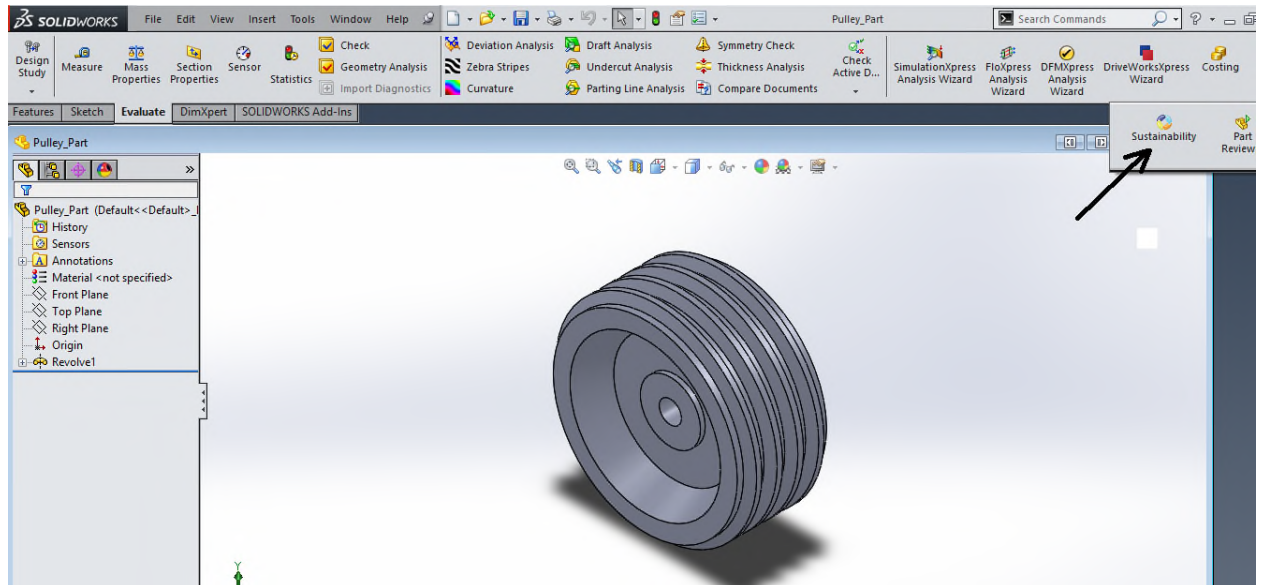
## **Chapter 23: Cam Design**

Projects 1—2 are to be carried out as projects based on the content of chapter 23

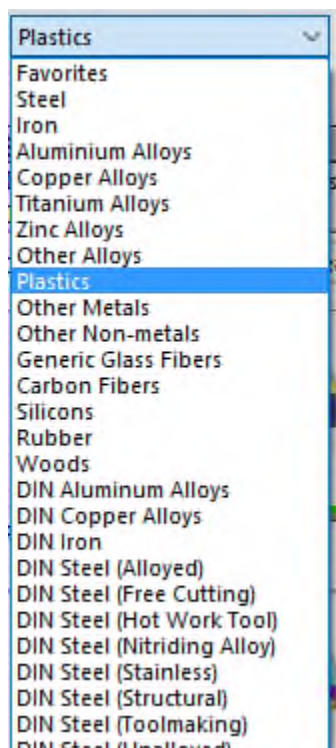


## Chapter 31: Sustainability Design for Parts

### 1. Problem 31-1



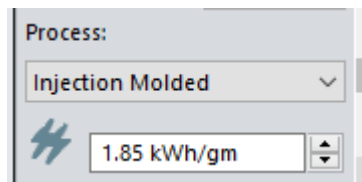
Step 1



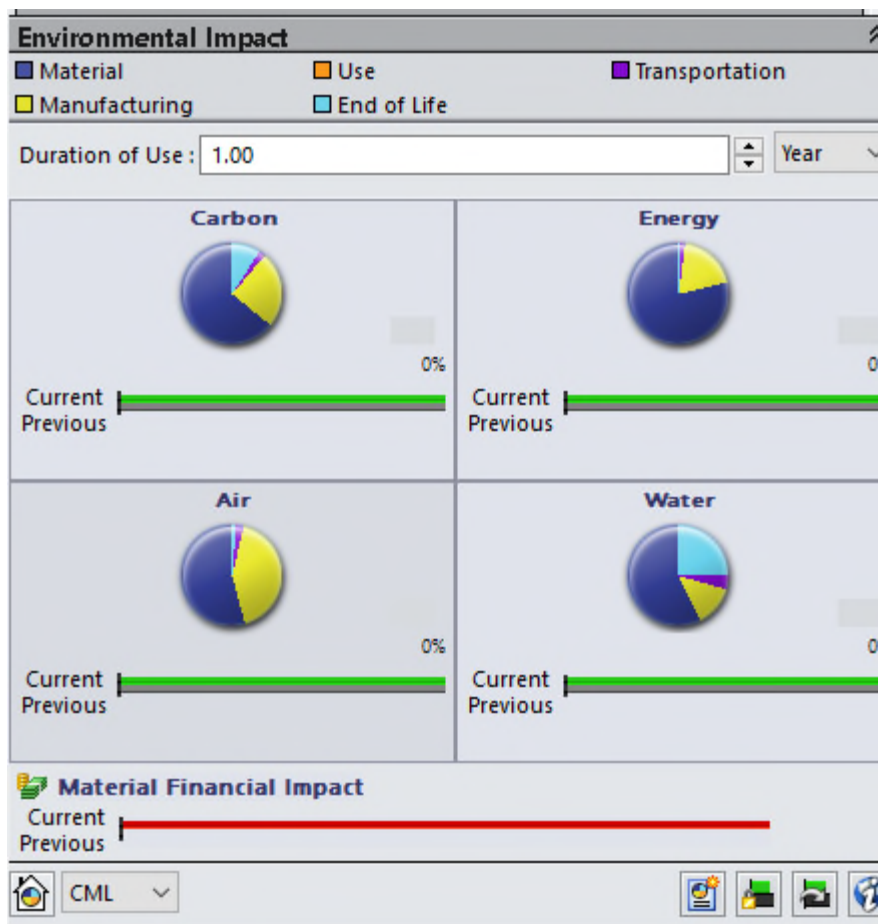
Step 2 Material



Step 3 Manufacturing



Step 4 Process



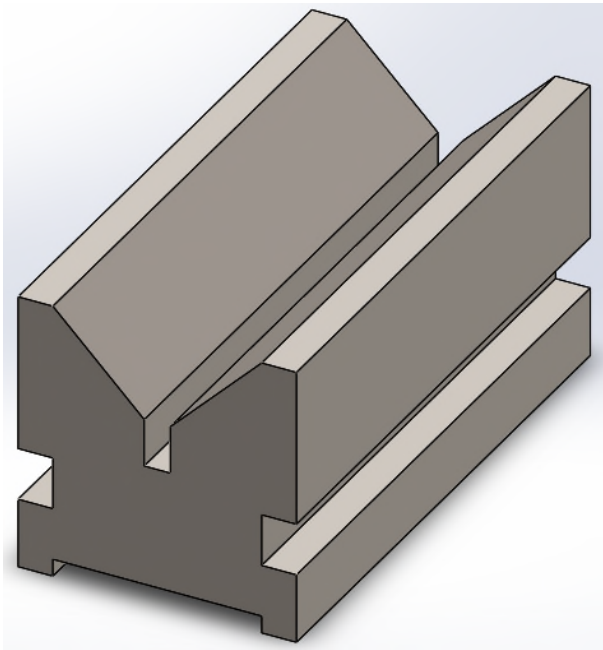
Step 5

## 2. Problem 31-2 to 13-4

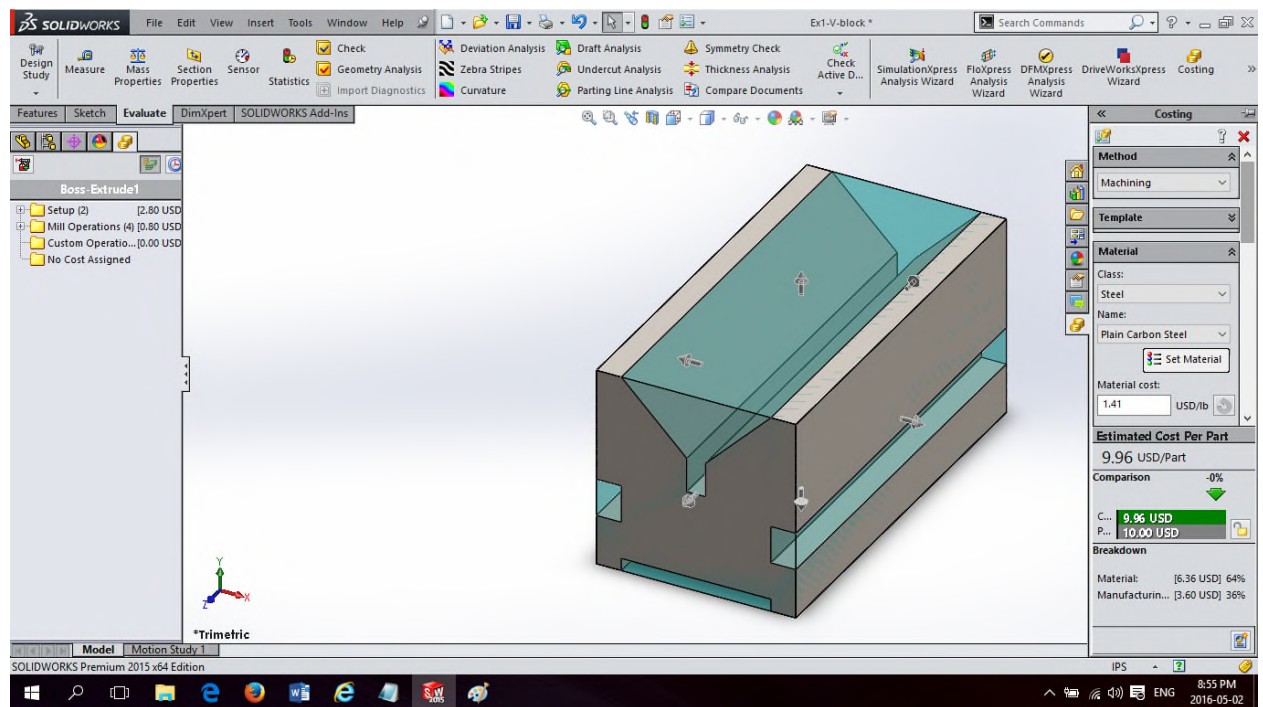
Repeat problem with models opened

## Chapter 33: Evaluating the Cost of Machined Parts

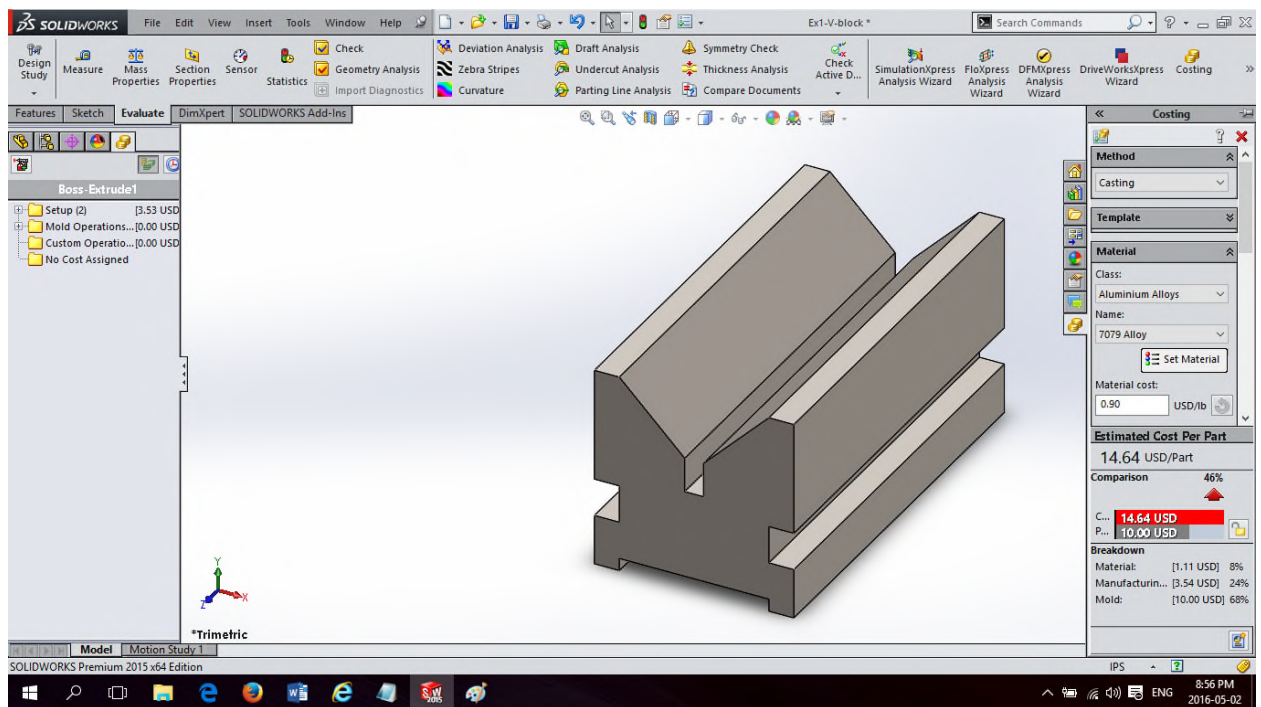
### 1. Problem 33-1



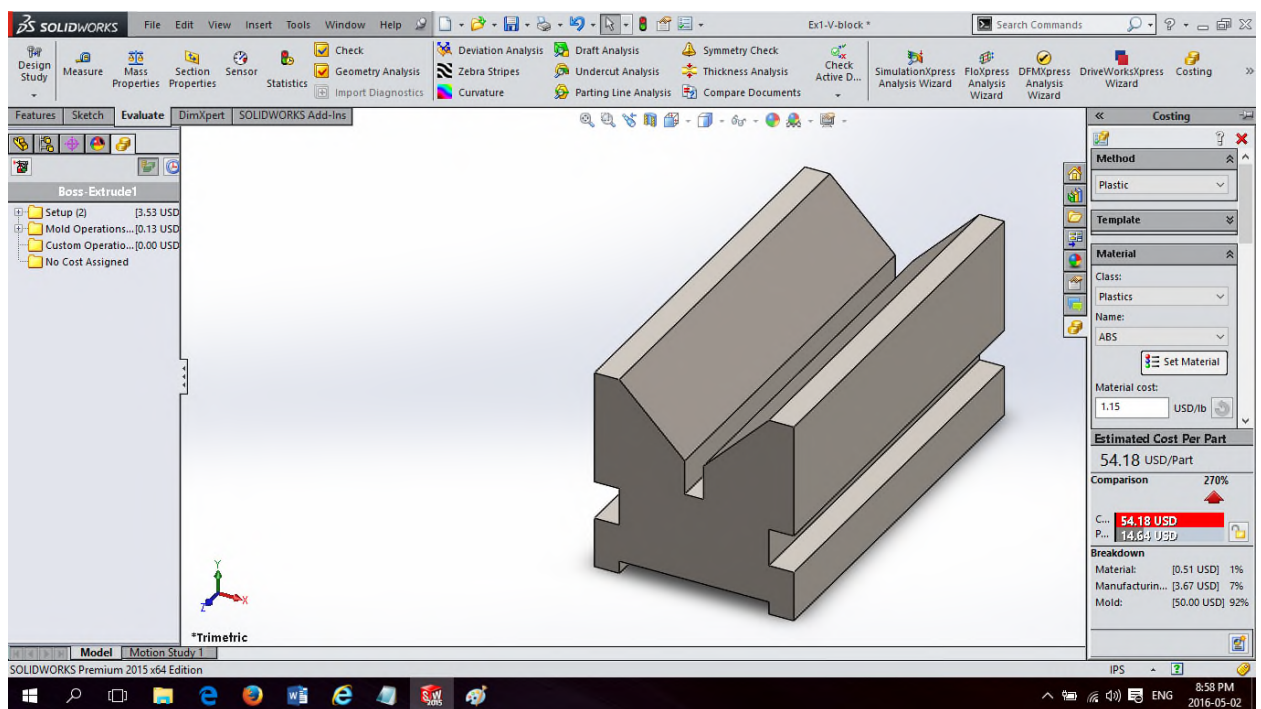
Step 1



Machining: Steel

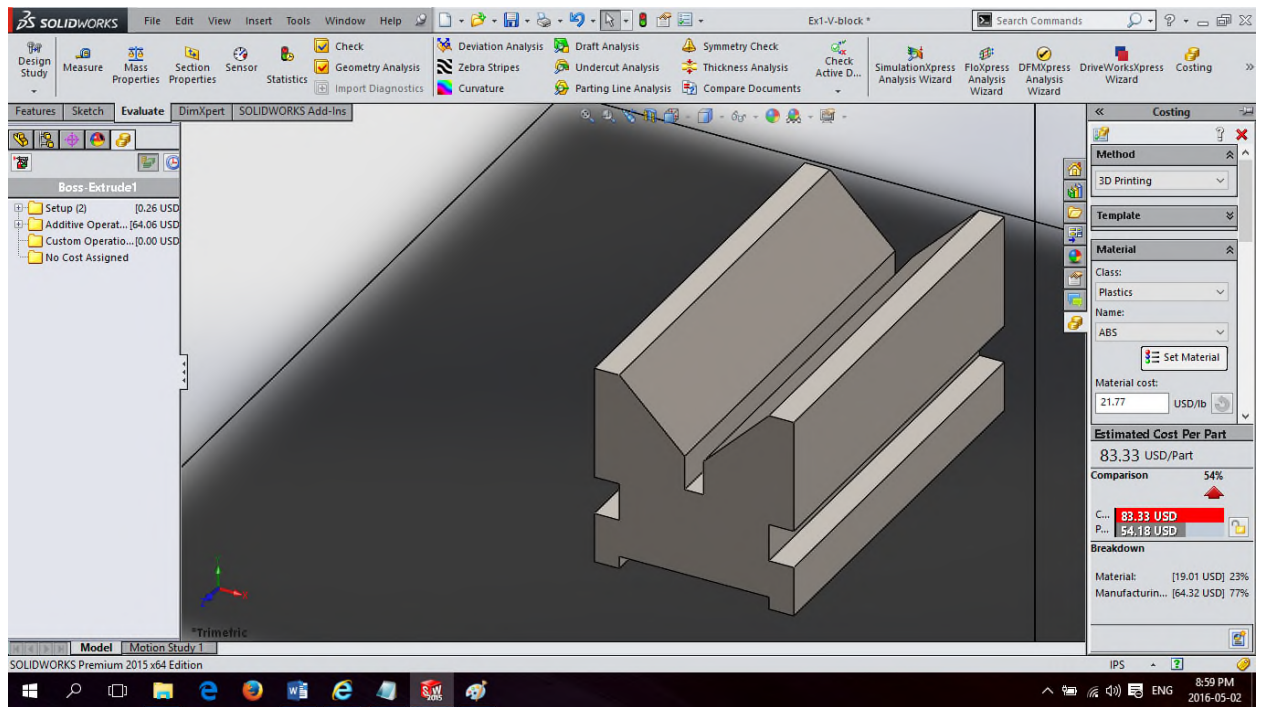


Casting: Aluminum



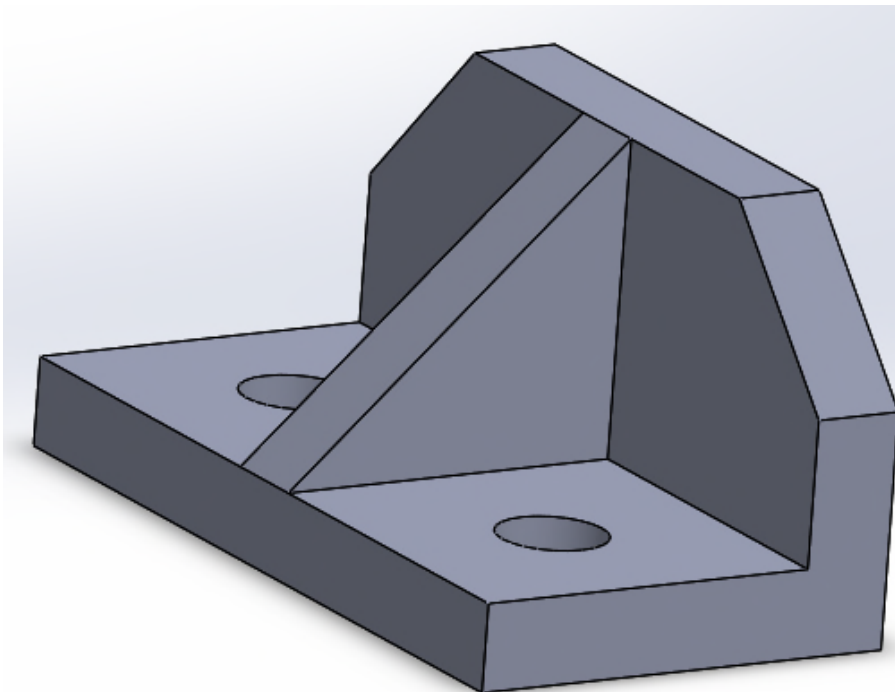
Injection Molding: Plastic



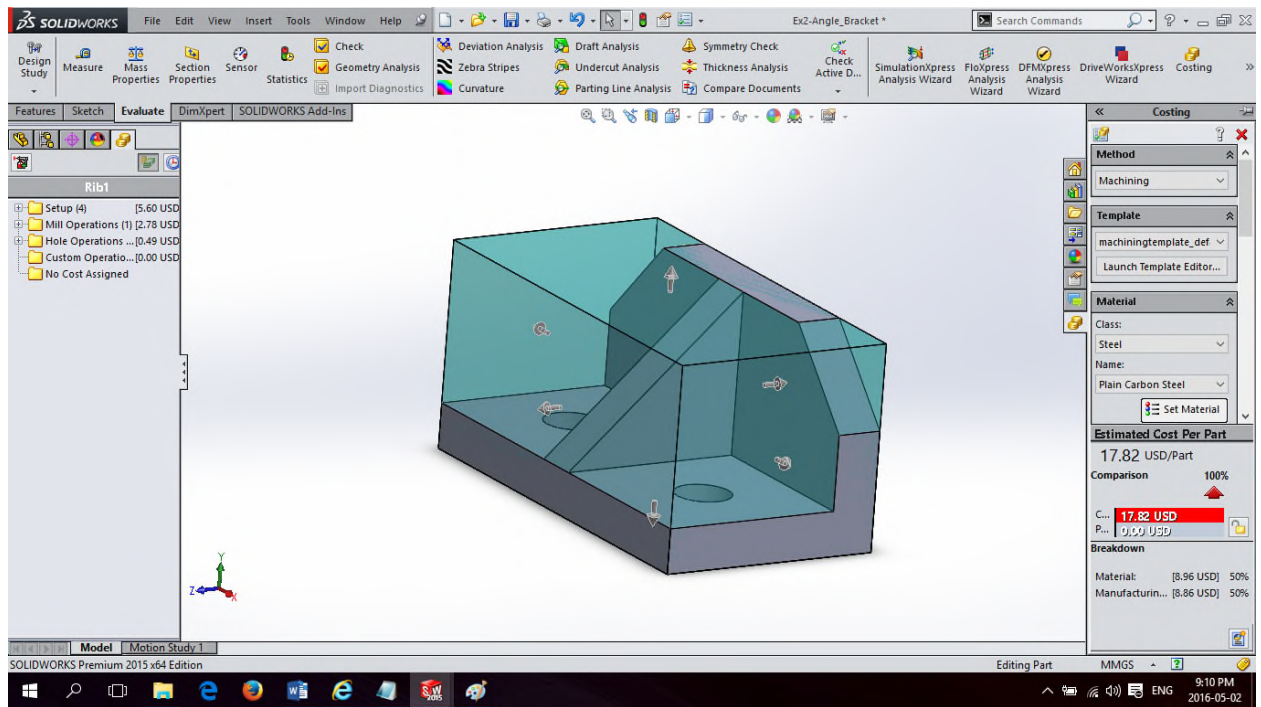


3D Printing: Plastic (ABS)

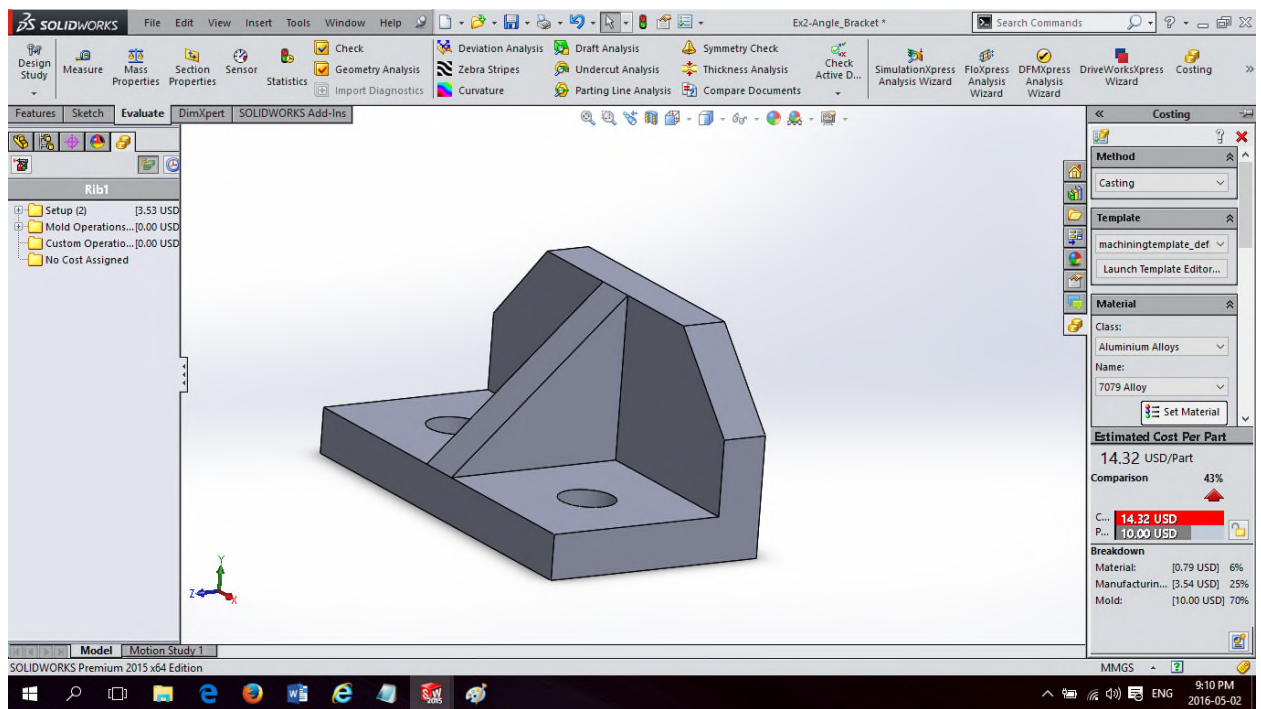
## 2. Problem 33-2



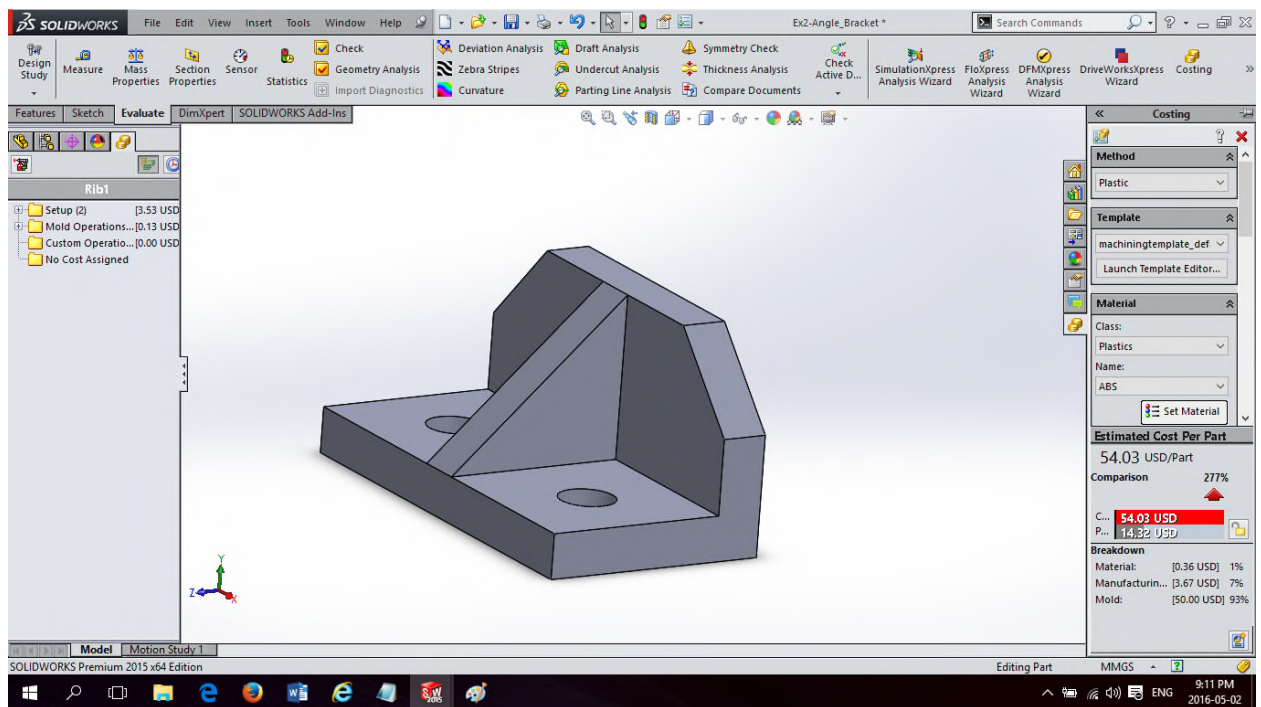
Step 1



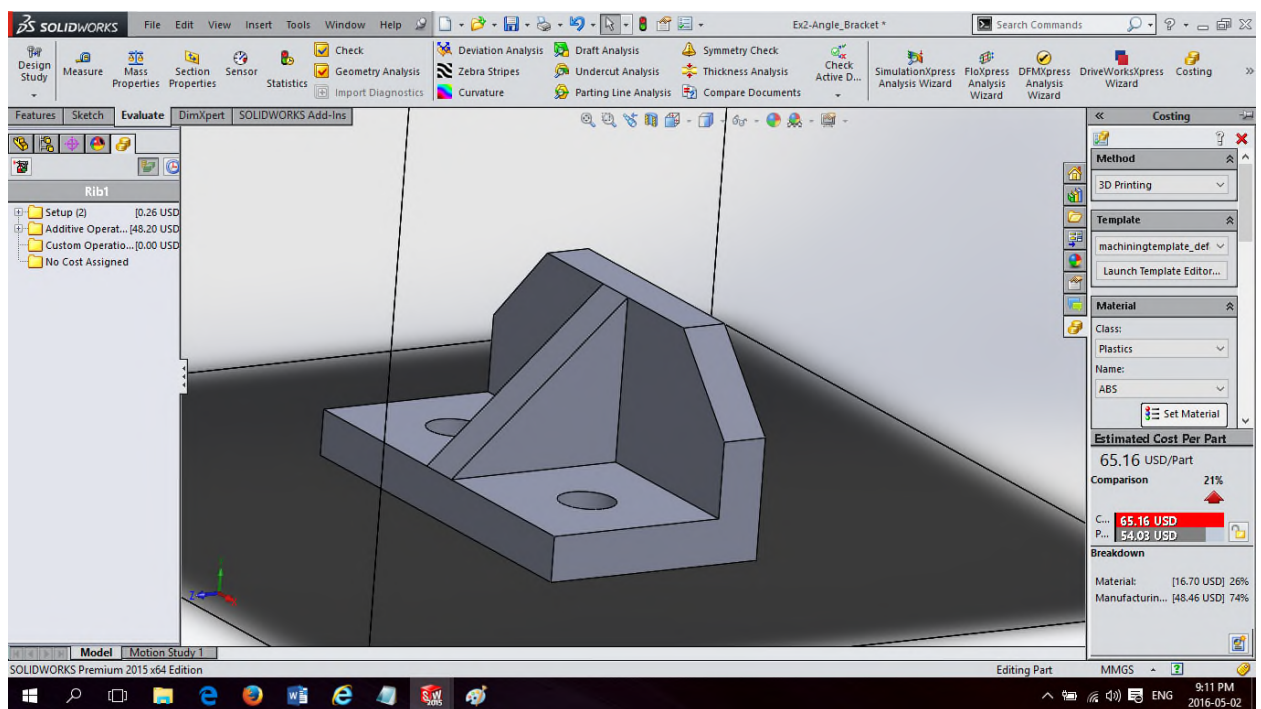
Machining: Steel



Casting: Aluminum



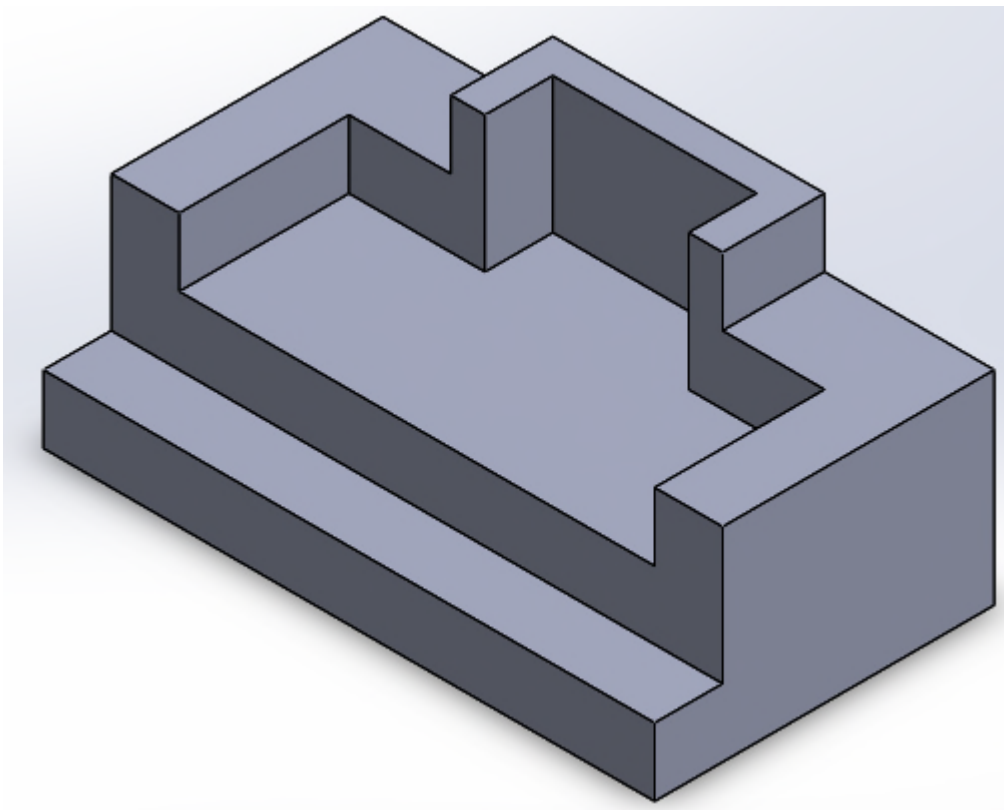
Injection Molding: Plastic



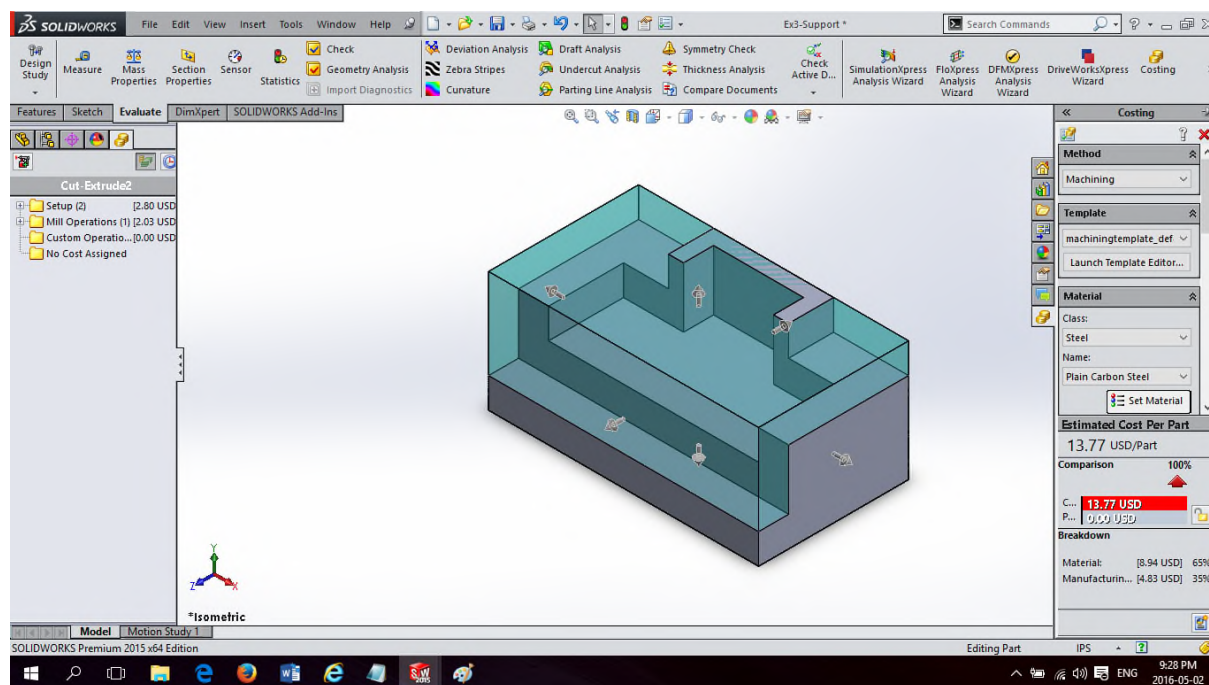
3D Printing: Plastic (ABS)



### 3. Problem 33-3

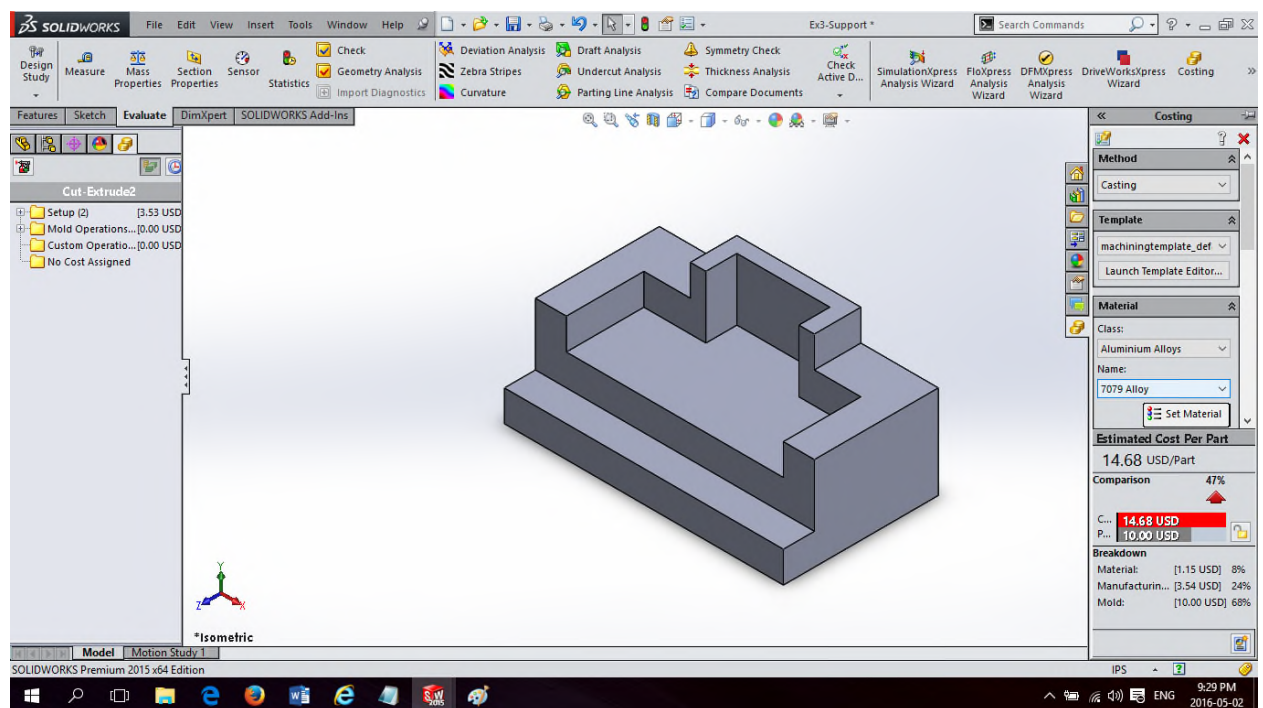


Step 1

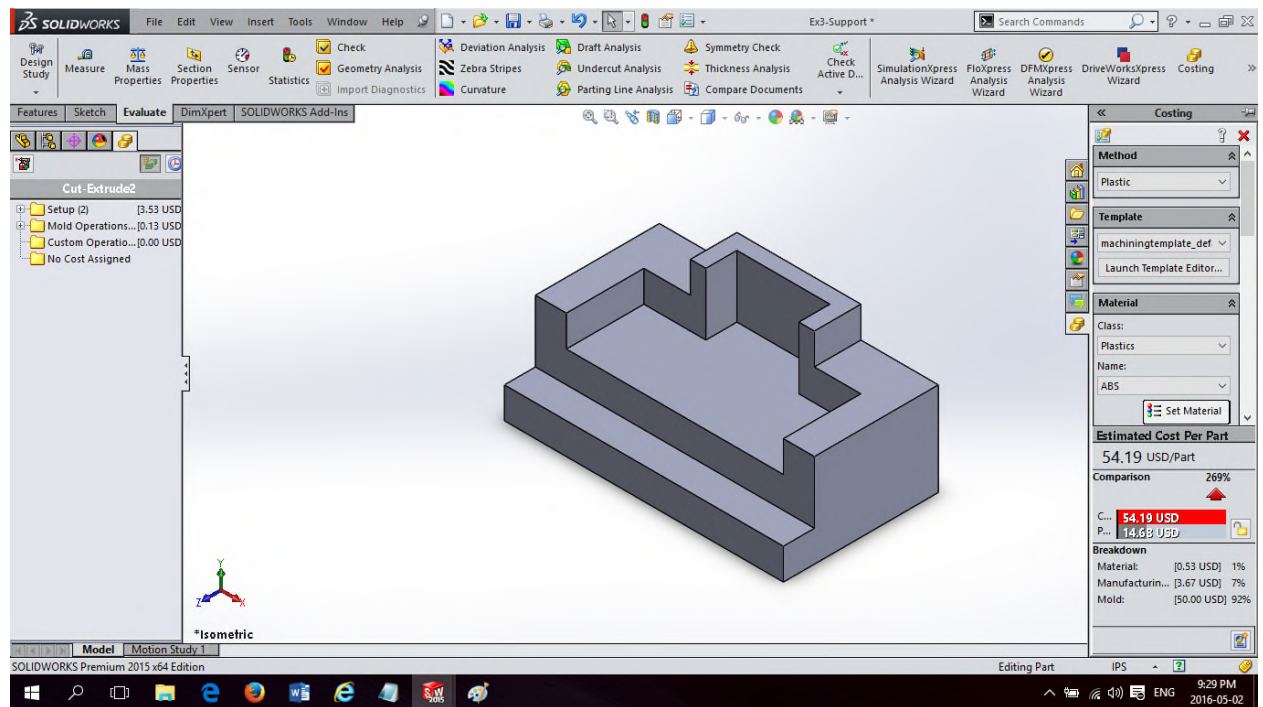


Machining: Steel

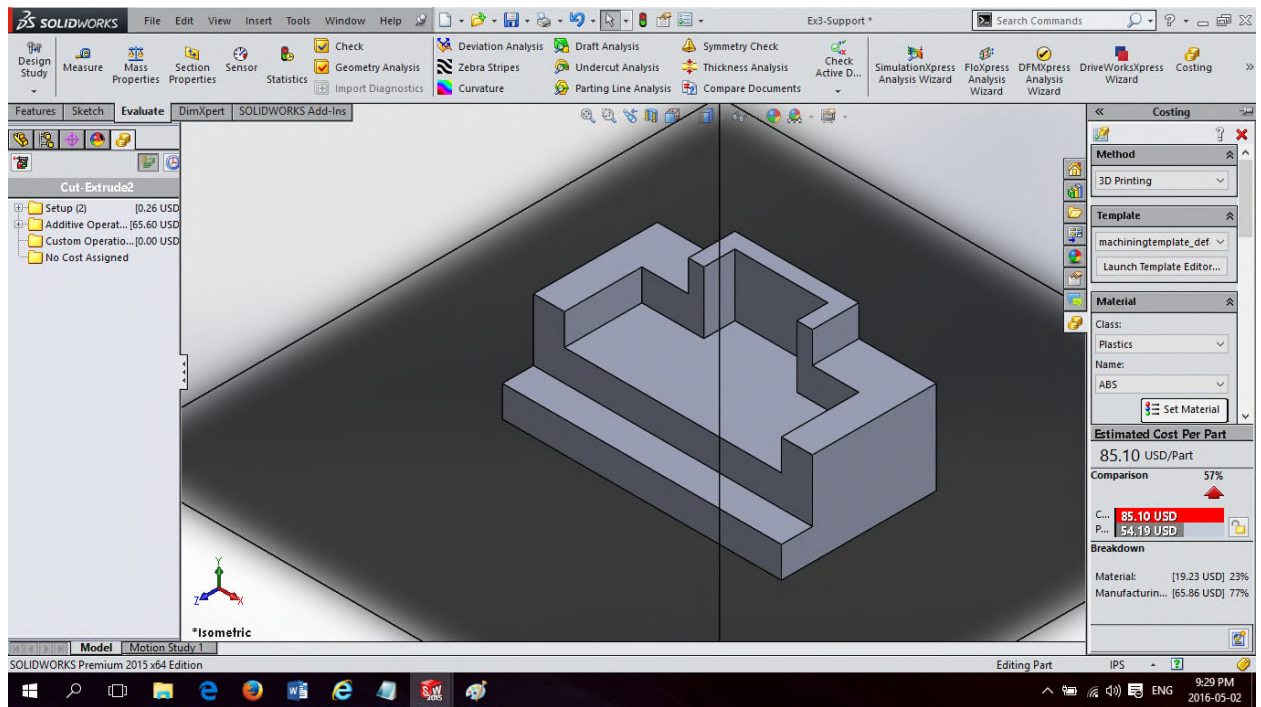




Casting: Aluminum



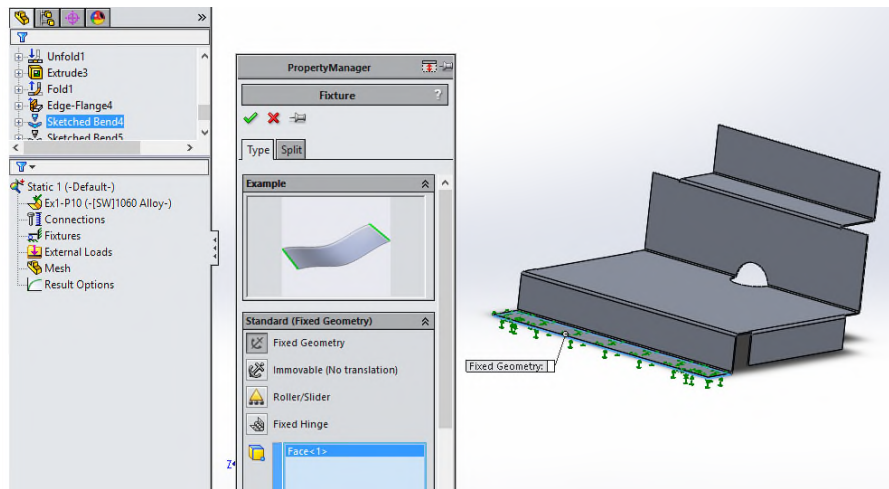
Injection Molding: Plastic



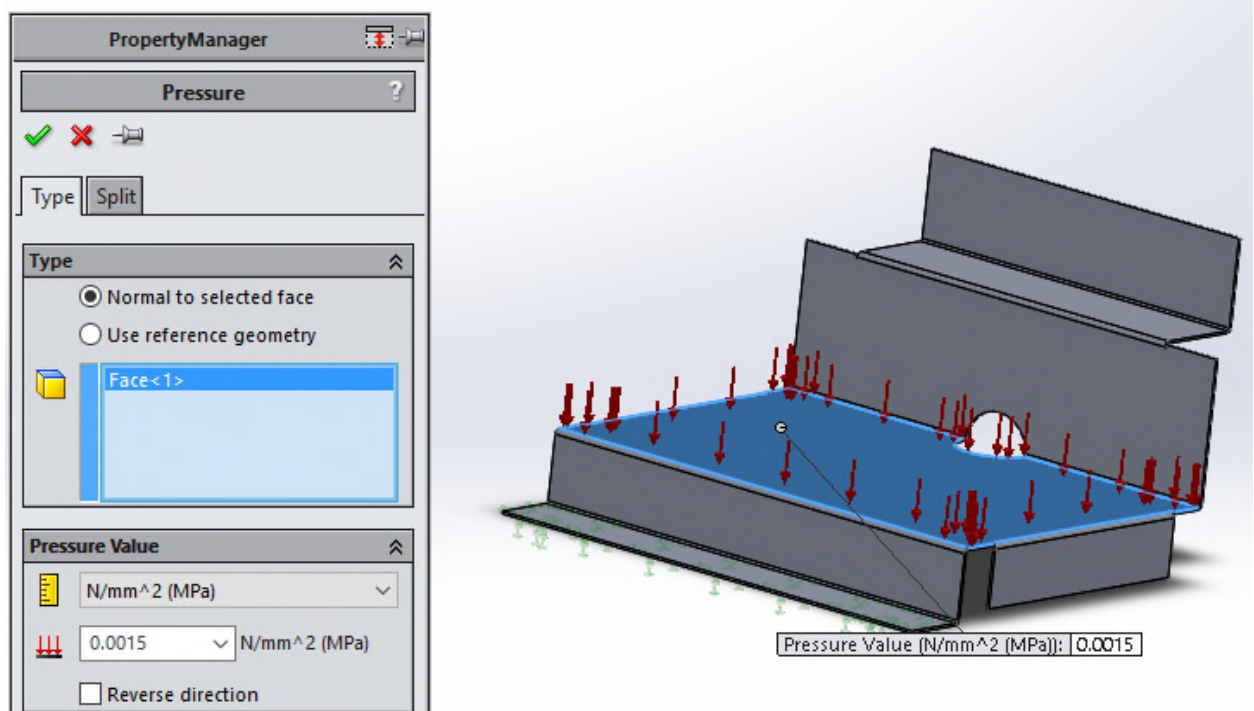
3D Printing: Plastic (ABS)

## 34: Finite Element Analysis Using SolidWorks

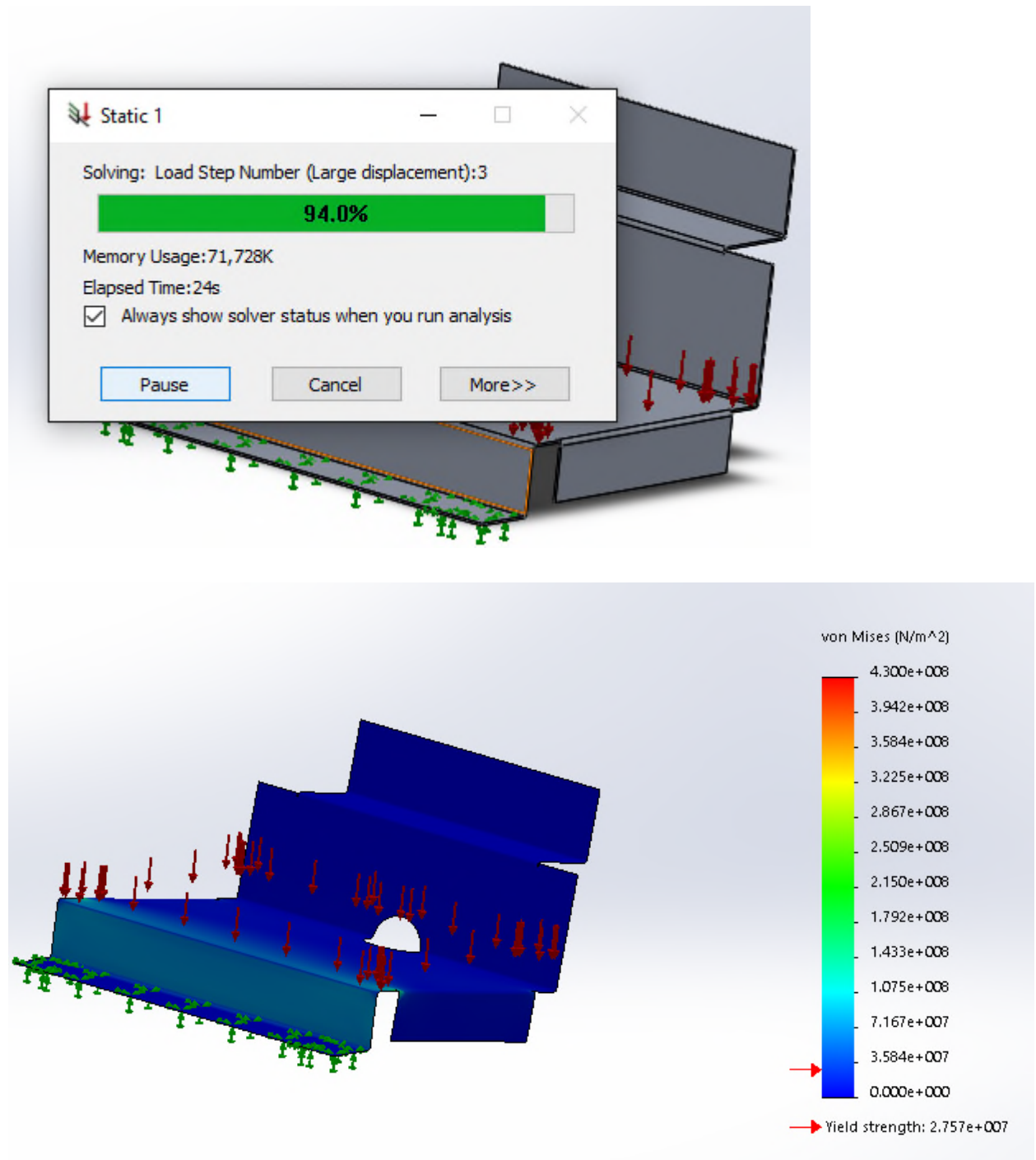
### 1. Problem 34-1



Step 1



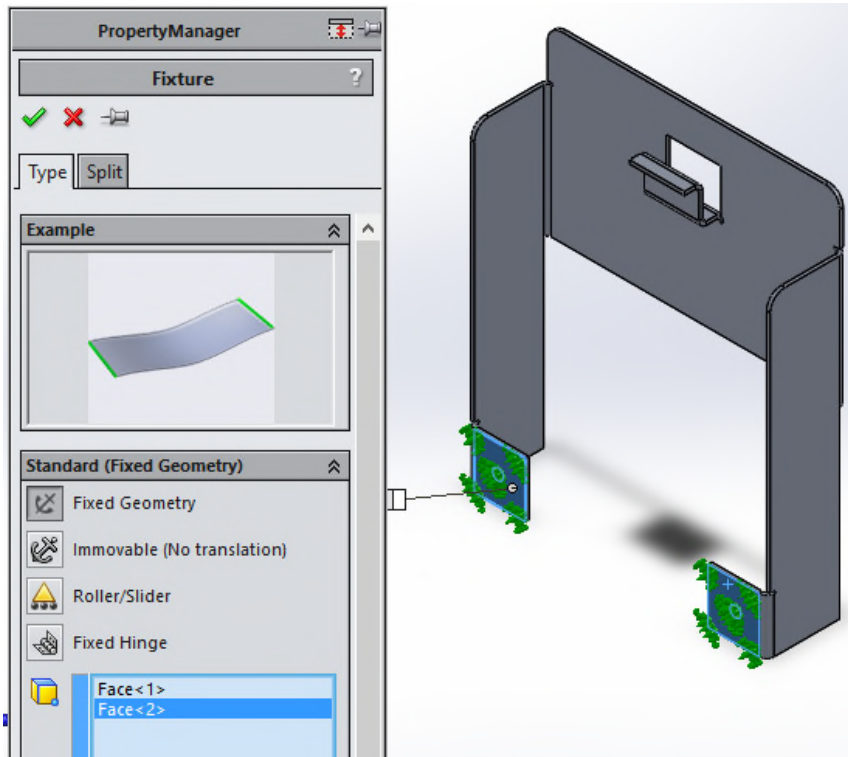
Step 2



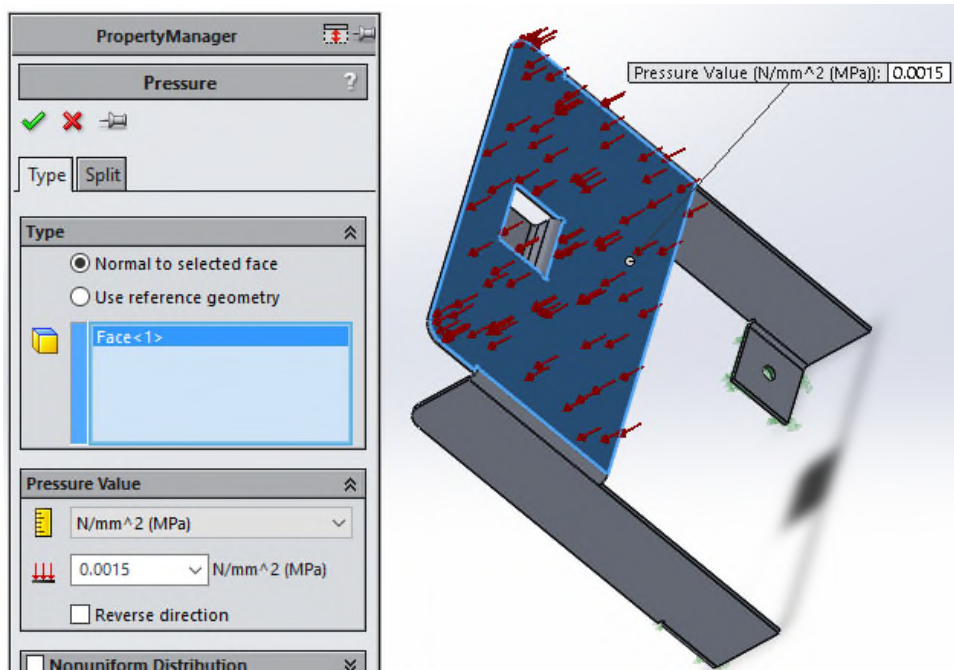
Repeat with conditions in (b) and (c)



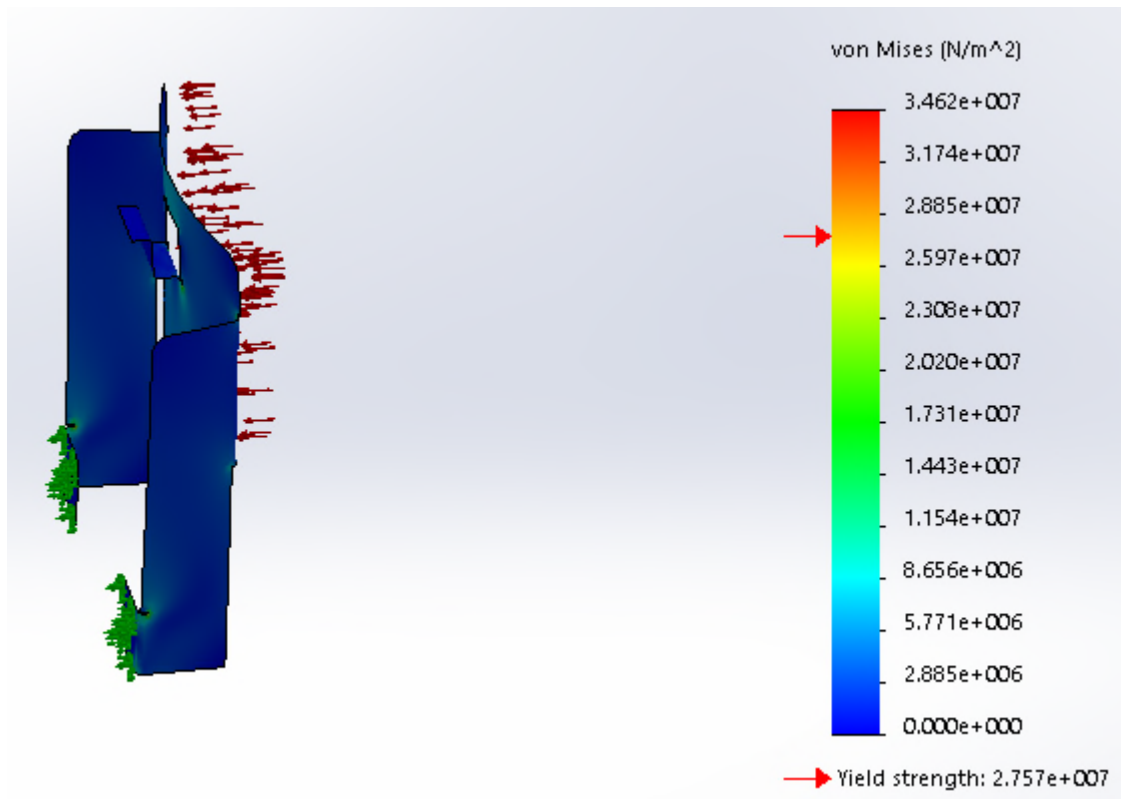
## 2. Problem 34-2



Step 1



Step 2



Step 3