

ME 1403 Engineering Practice & Graphics

Fall - 2017

# Lecture 7

Chapter-5

Instructor:

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# Outline

- Tools / Methods
  - Section Properties / Mass Properties
  - Extrude
  - Thin Feature
  - Revolve
  - Material
- Practice
  - Tutorial-1 (Will be Graded)
  - Tutorial-3 (Will be Graded)
- Discussion
  - Questions till Now
  - Mid-Term Exam!

# Section Properties / Mass Properties

**Section Properties**

Face <1>

Options...

Recalculate

Report coordinate values relative to: -- default --

Section properties of the selected face of Part1

Area = 3605.12 millimeters<sup>2</sup>

Centroid relative to output coordinate system origin: ( millimeters )

X = 0.00  
Y = 30.21  
Z = 0.00

Moments of inertia of the area, at the centroid: ( millimeters <sup>4</sup> )

Lxx = 288709.87	Lxy = 0.00	Lxz = 0.00
Lyx = 0.00	Lyy = 4351775.66	Lyz = 0.00
Lzx = 0.00	Lzy = 0.00	Lzz = 4063065.79

Polar moment of inertia of the area, at the centroid = 4351775.66 millimeters <sup>4</sup>

Angle between principal axes and part axes = 90.00 degrees

Principal moments of inertia of the area, at the centroid: ( millimeters <sup>4</sup> )

lx = 288709.87  
ly = 4063065.79

Moments of inertia of the area, at the output coordinate system: ( millimeters <sup>4</sup> )

LXX = 3579986.25	LXY = 0.00	LXZ = 0.00
LYX = 0.00	LYY = 4351775.66	LYZ = 0.00
LZX = 0.00	LZY = 0.00	LZZ = 7354342.16

Help Print... Copy to Clipboard

**Mass Properties**

Part1.SLDPRT

Options...

Override Mass Properties... Recalculate

Include hidden bodies/components

Create Center of Mass feature

Show weld bead mass

Report coordinate values relative to: -- default --

Mass properties of Part1

Configuration: Default

Coordinate system: -- default --

Density = 0.00 grams per cubic millimeter

Mass = 217.86 grams

Volume = 217857.20 cubic millimeters

Surface area = 25012.20 square millimeters

Center of mass: ( millimeters )

X = 0.00  
Y = 0.00  
Z = 0.00

Principal axes of inertia and principal moments of inertia: ( grams \* square millimeters )

Taken at the center of mass.

lx = ( 1.00, 0.00, 0.00)	Px = 83743.98
ly = ( 0.00, 1.00, 0.00)	Py = 262977.70
lz = ( 0.00, 0.00, 1.00)	Pz = 311828.22

Moments of inertia: ( grams \* square millimeters )

Taken at the center of mass and aligned with the output coordinate system.

Lxx = 83743.98	Lxy = 0.00	Lxz = 0.00
Lyx = 0.00	Lyy = 262977.70	Lyz = 0.00
Lzx = 0.00	Lzy = 0.00	Lzz = 311828.22

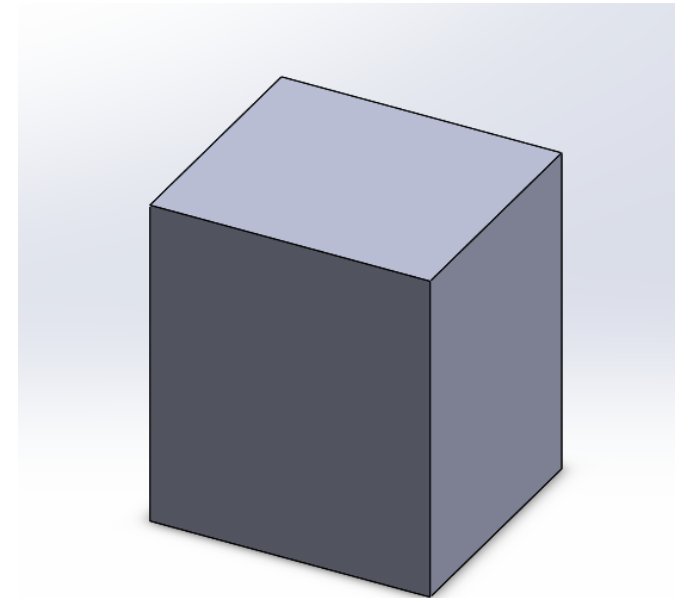
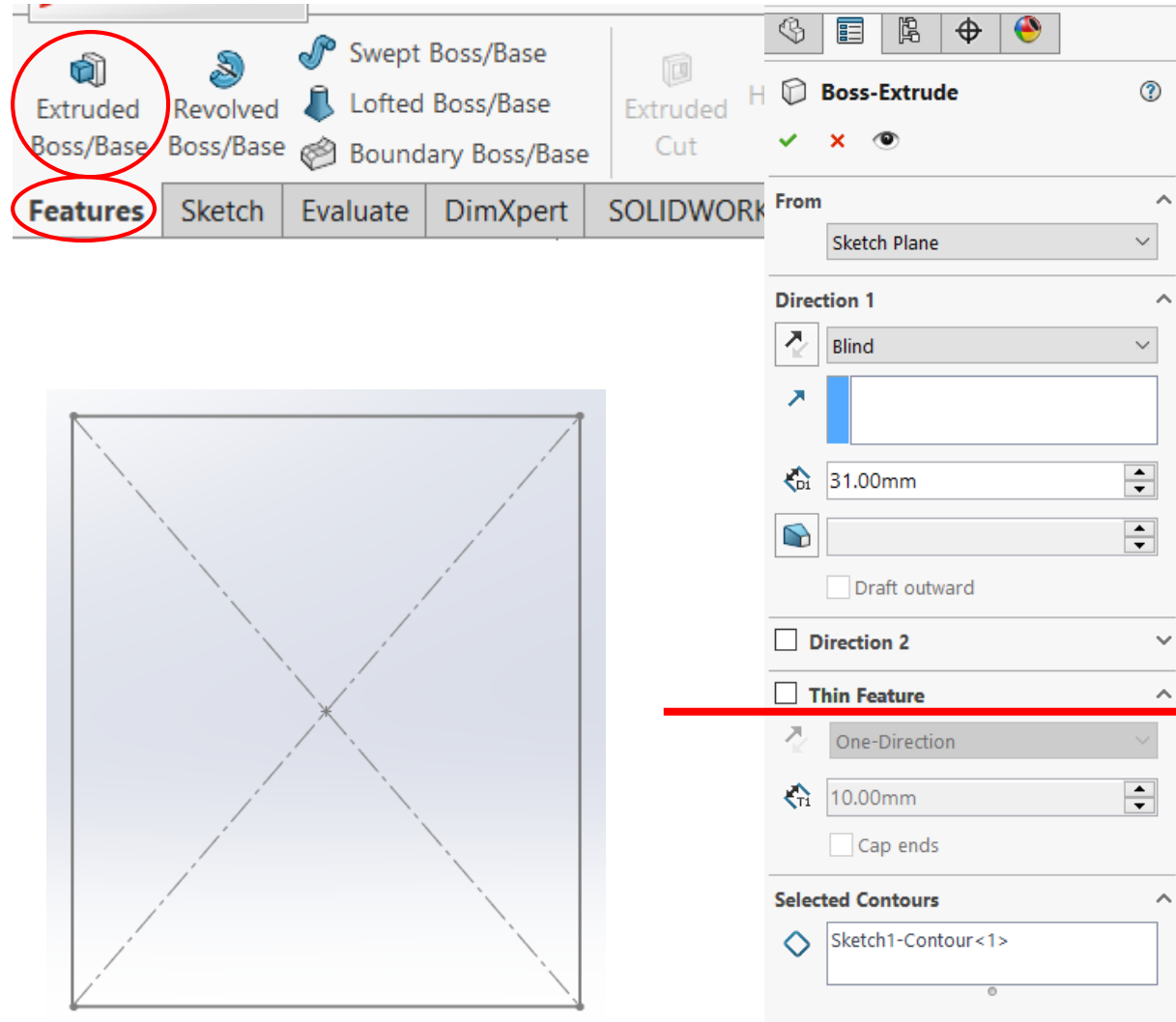
Moments of inertia: ( grams \* square millimeters )

Taken at the output coordinate system.

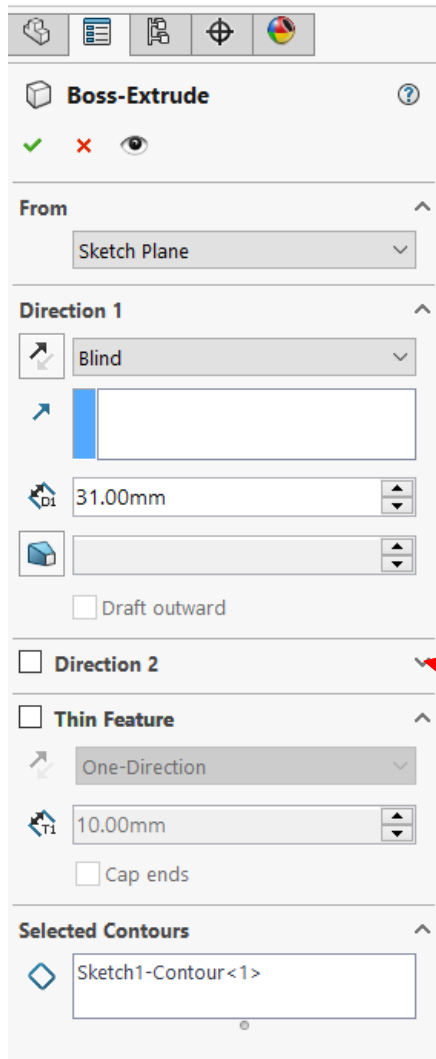
lxx = 83743.98	lxy = 0.00	lzx = 0.00
lyx = 0.00	lyy = 262977.70	lyz = 0.00
lzx = 0.00	lzy = 0.00	lzz = 311828.22

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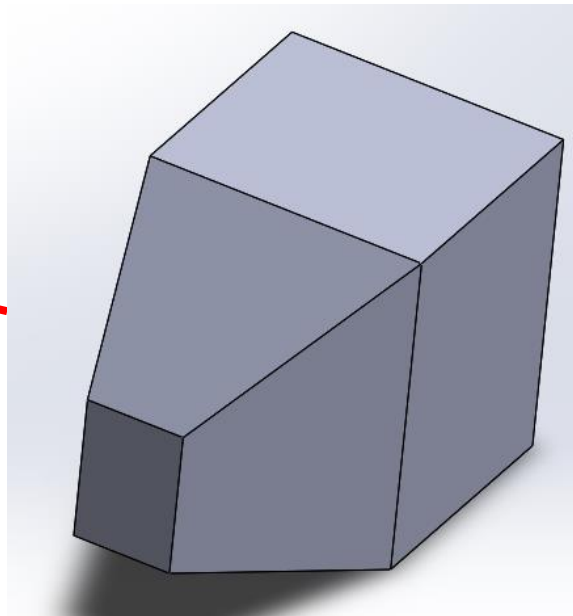
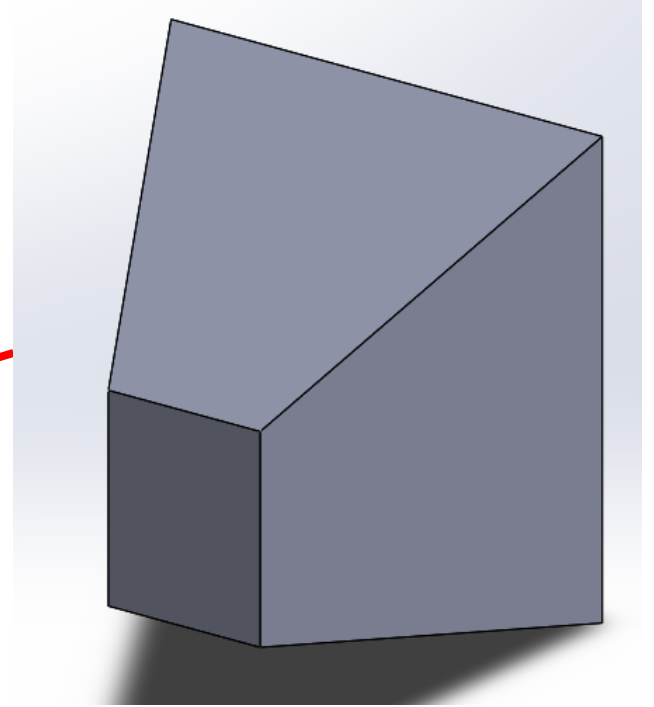
# Extrude



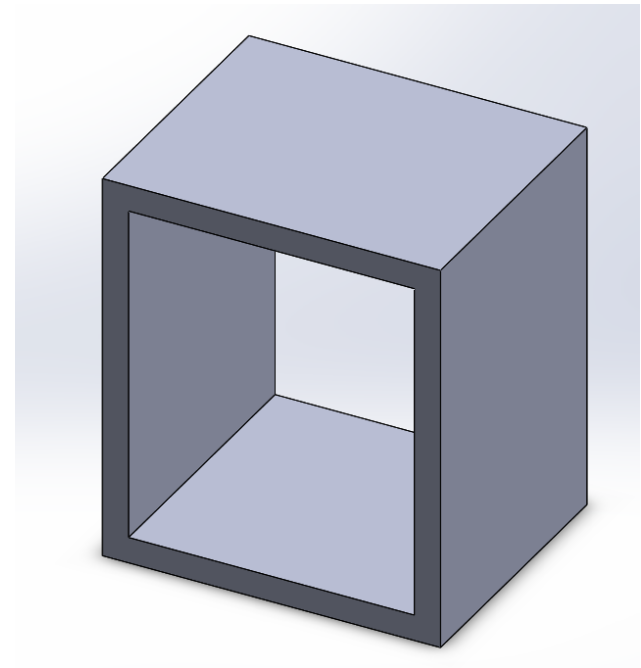
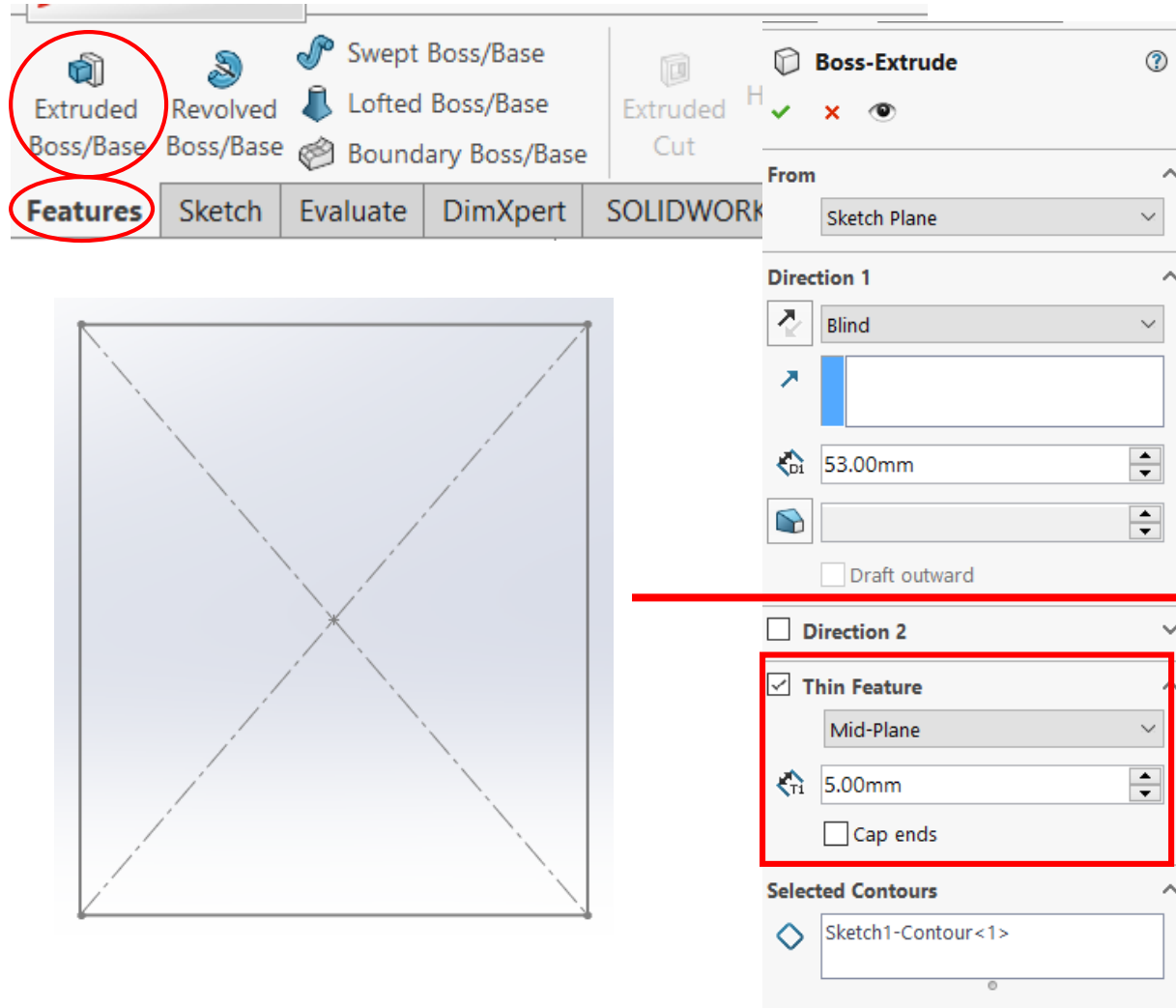
# Extrude (Draft Angle/ Direction 2)



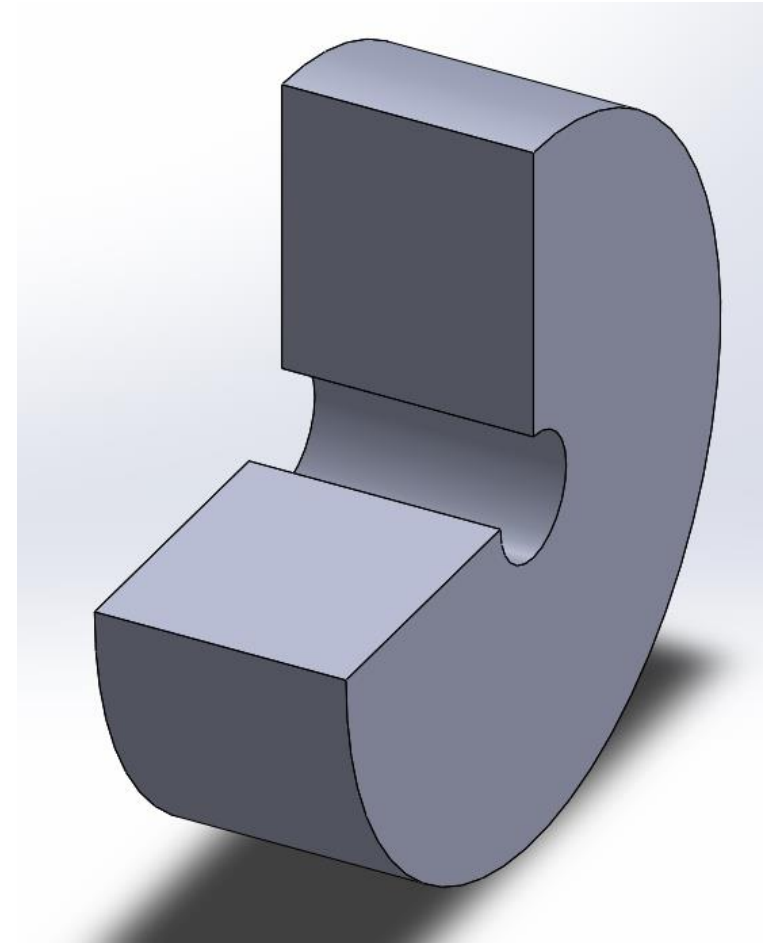
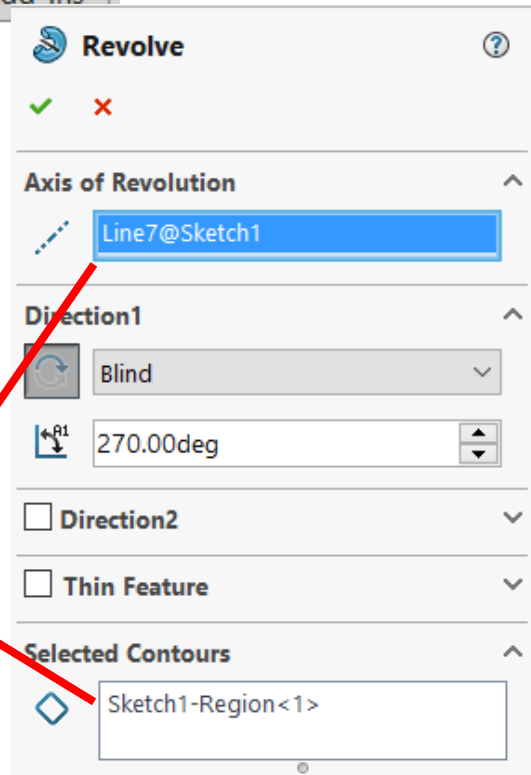
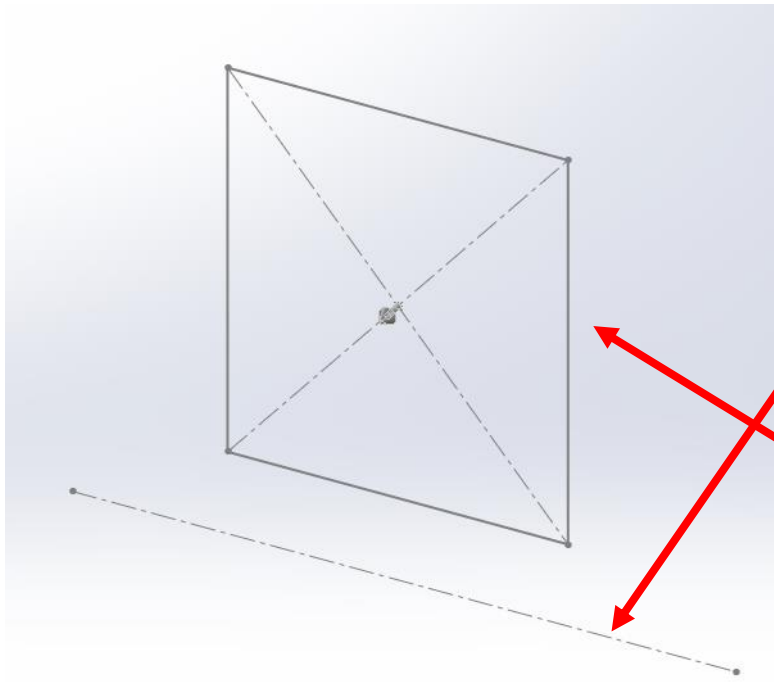
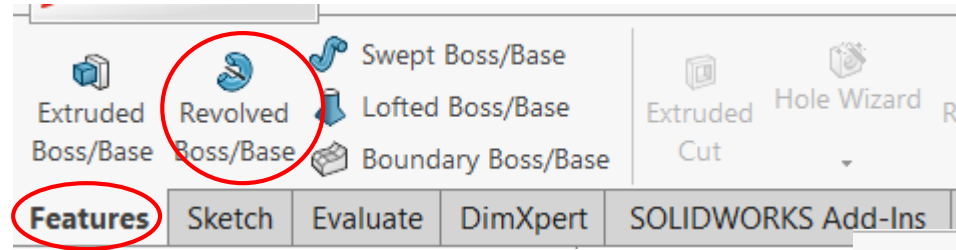
20 degree



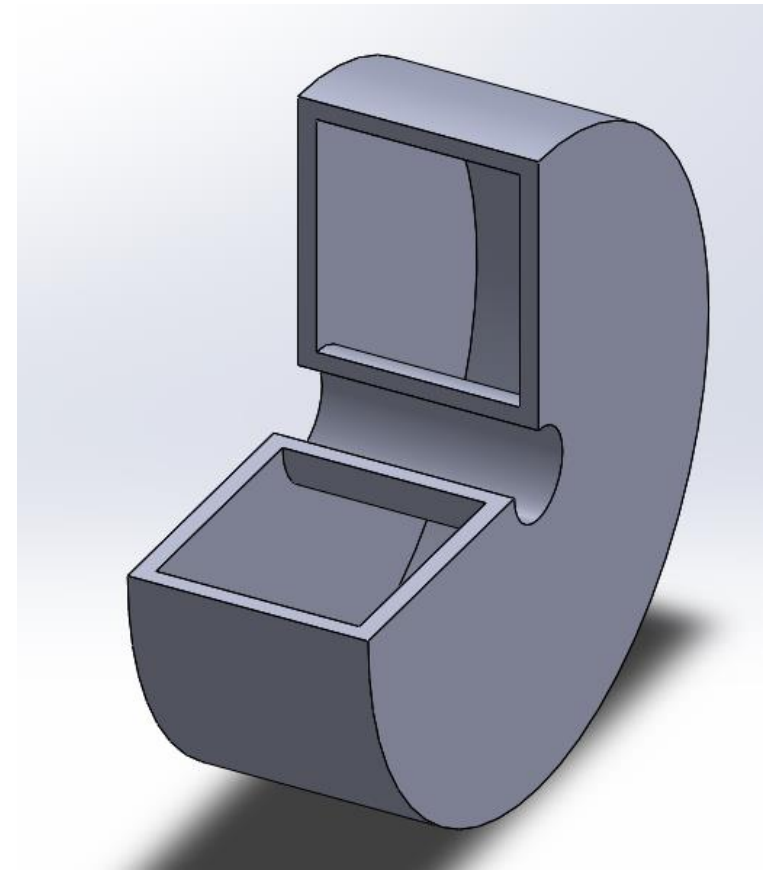
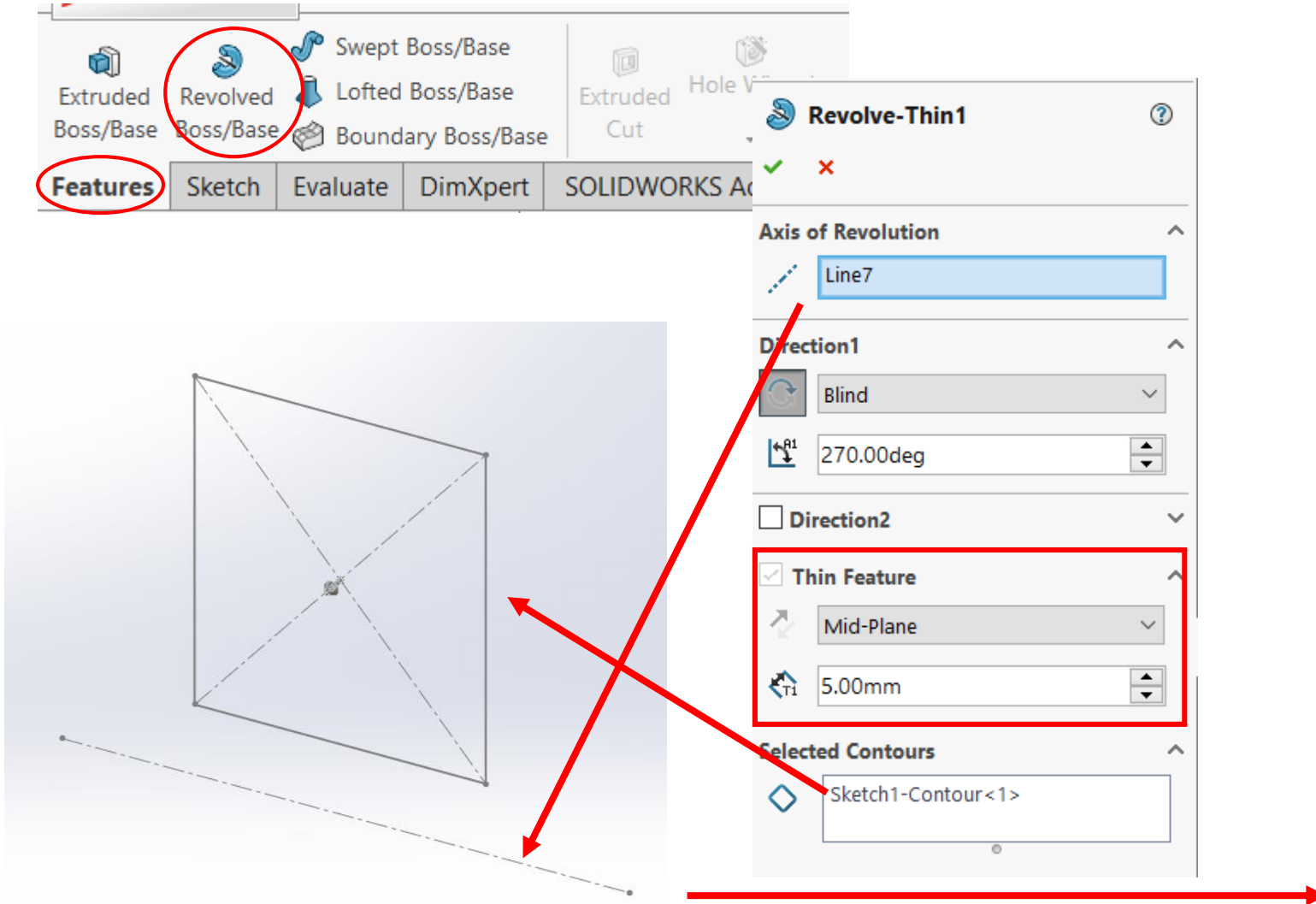
# Thin Extrude



# Revolve

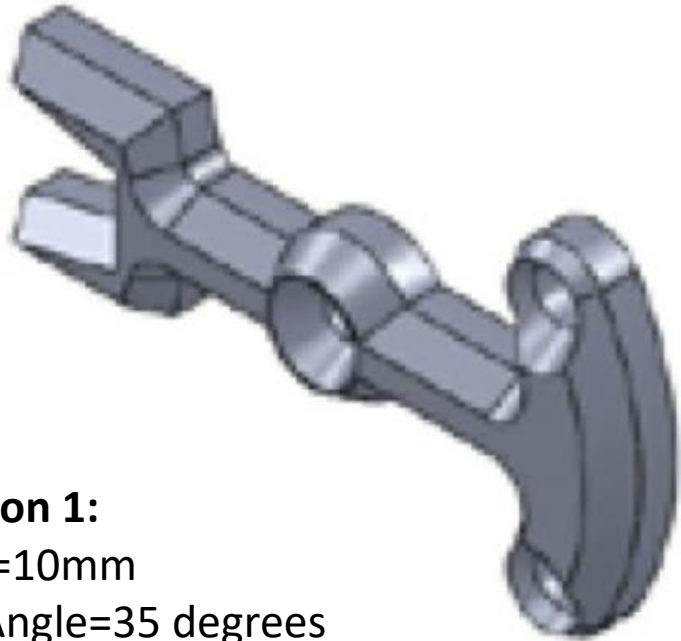


# Thin Revolve





# Tutorial 1 (Will be Graded)



## Direction 1:

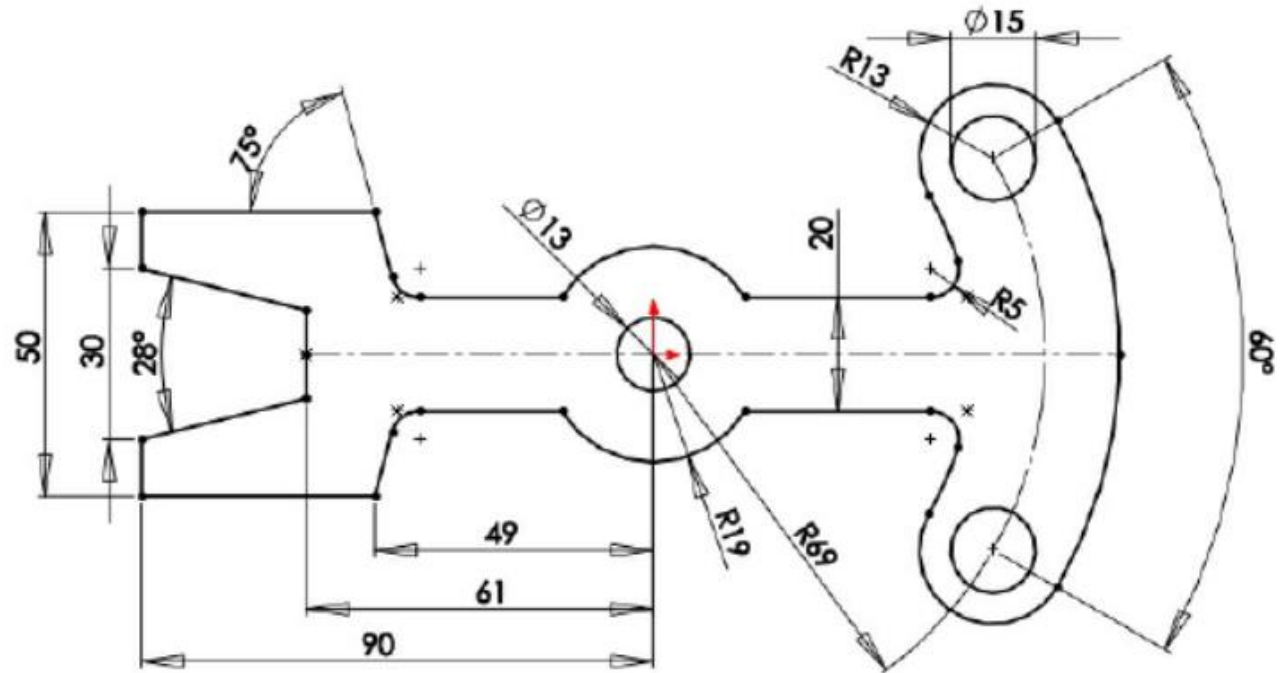
Depth=10mm

Draft Angle=35 degrees

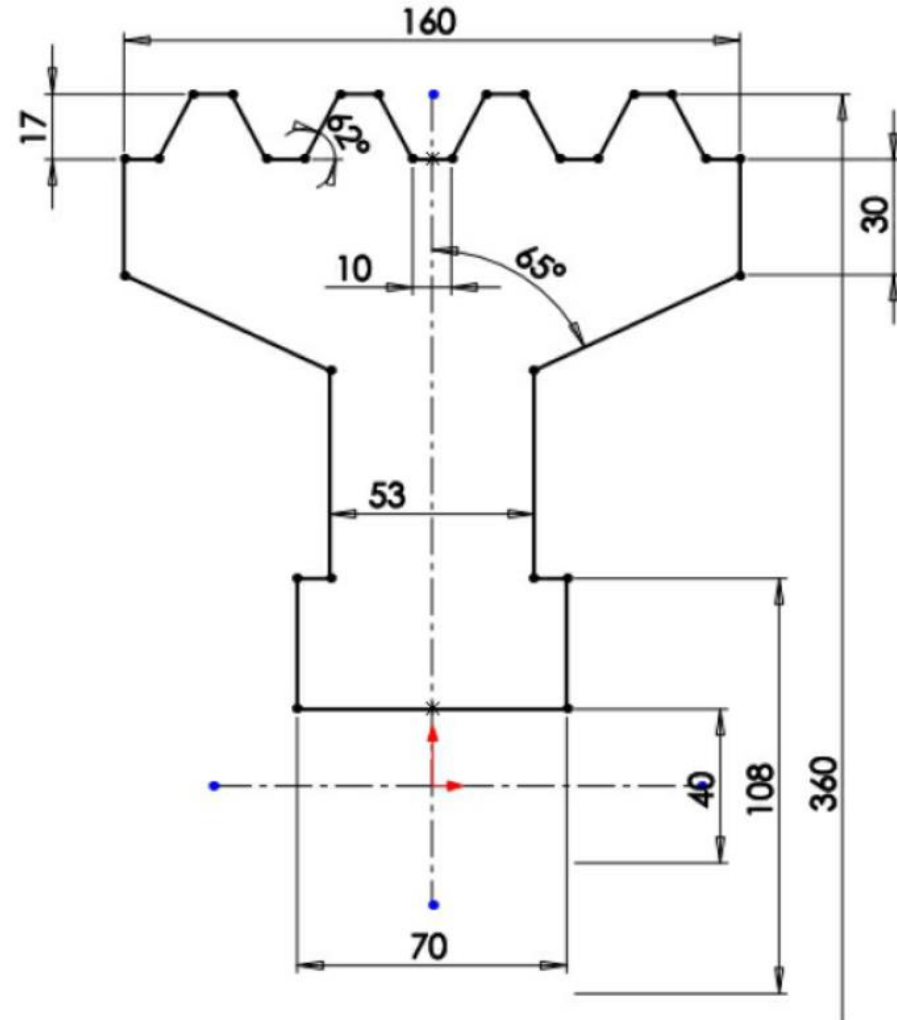
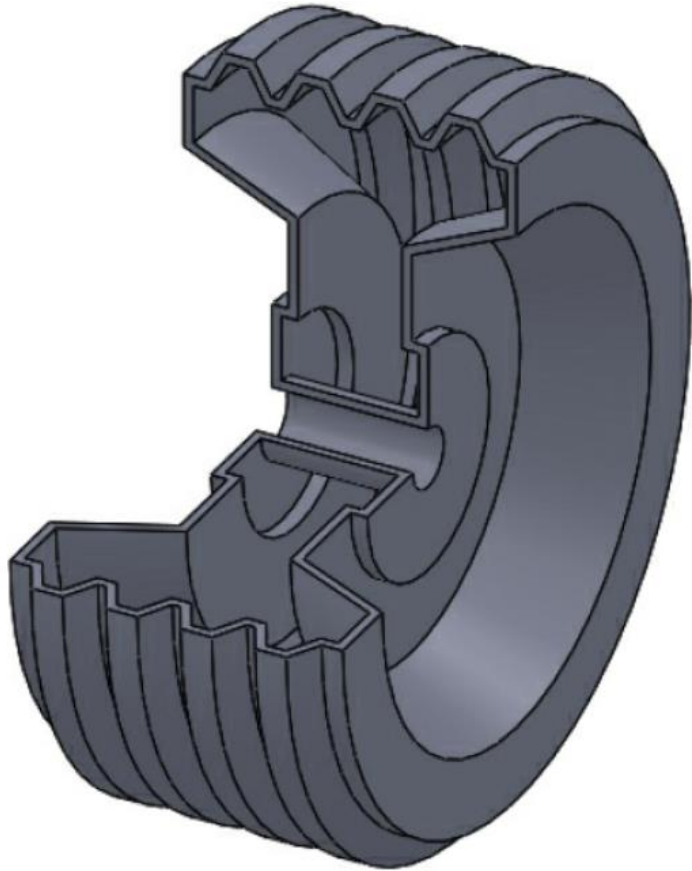
## Direction 1:

Depth=15mm

Draft Angle=0 degrees



# Tutorial 3 (Will be Graded)



## Thin Feature

Angle of Rotation=270 degrees

Thin thickness=5mm

File Name: Your ID\_Ch5Tut3

# Midterm Exam!

- Syllabus: Chapter-2,3,4
- Time: 40 minutes
- Questions:
  - 2 sketches

# Submission Rules

- Homework's are due **at the beginning of the first lab** of the following week.
- Quiz's will be taken.
- Submit everything via **Blackboard**.
- Copying your assignments are **prohibited**. If you do so, you and the individual you copied from will receive a **grade zero**, plus both of you will be referred for actions as described in the university's policy for academic dishonesty. ([Read Section 203 of the Student Code of Conduct 2013-2013 UTSA Information Bulletin](#)).

# Submission Rules

- Any submission after deadline **will not be accepted** and thus will receive a **grade of zero**.
- Grading Criteria for Late Submission:
  - Submission on Time : 100%
  - Submission a week late : 75%
  - Submission two week late : 0%
- Naming Convention for your submission files:
  - *(your myUTSA id)\_(Number/Name of the HomeWork)*
- For Example if your myUTSA id is “**abc123**” and You are submitting “**HW1**”. Then your submission file name should be “**abc123\_HW1**”.