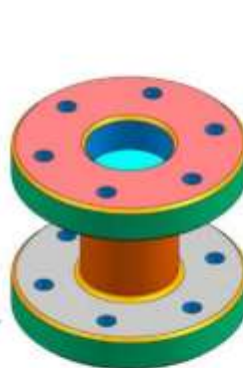
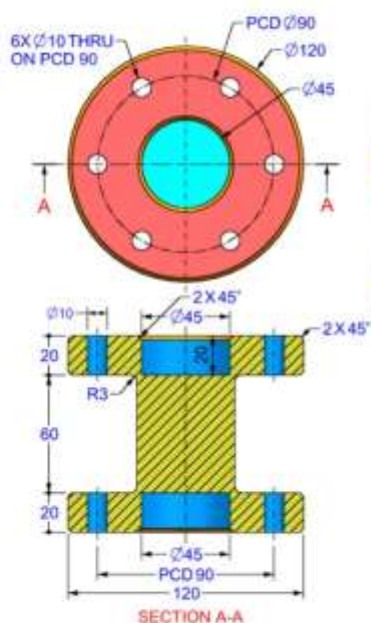
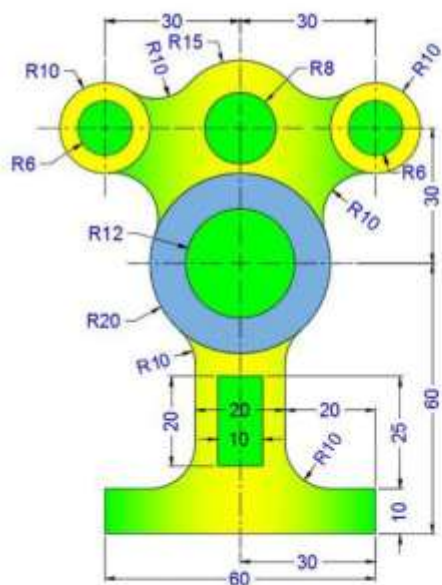


# DesignSpark Mechanical ALL IN ONE WORKBOOK

## 500+ PRACTICE EXERCISES

- **Sketching**
- **3D Modeling**
- **Assembly**



**SACHIDANAND JHA**

# DesignSpark Mechanical ALL IN ONE WORKBOOK

500+ PRACTICE EXERCISES

2D Sketching • 3D Modeling • Assembly Drawings

SACHIDANAND JHA

**COLOR EDITION**



Dear Reader,

Thank you for choosing the **DesignSpark Mechanical ALL IN ONE WORKBOOK**. This book is part of the CADIN360° learning series, created to help engineers, students, and professionals master **DesignSpark Mechanical** through structured and practical exercises.

This book contains over 500 carefully crafted practice drawings, including:

- 200 2D Sketching Exercises
- 200 3D Modeling Exercises
- Comprehensive Assembly Models with 150+ Individual Part Drawings

We founded CADIN360 in 2016 with the goal of delivering practical, high-quality learning material for CAD software. More than 9 years later, we're still committed to producing consistently exceptional books. With each of our titles, we're working hard to set a new standard for the industry. From the paper we print on, to the authors we work with, our goal is to bring you the best books available.

I hope you see all that reflected in these pages. I'd be very interested to hear your comments and get your feedback on how we're doing. Feel free to let me know what you think about this or any other CADIN360 book by sending me an email at [cadin360@gmail.com](mailto:cadin360@gmail.com)

If you think you've found a technical error in this book, please visit <https://cadin360.com/contact-us/>.

Customer feedback is critical to our efforts at CADIN360.

Best regards,

Sachidanand Jha  
Founder & CEO, CADIN360



# DesignSpark Mechanical ALL IN ONE WORKBOOK

Published by CADIN360

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# DesignSpark Mechanical ALL IN ONE WORKBOOK

- ❖ This book contains over 500 CAD practice exercises, organized as:
  1. 200 2D Sketching Exercises
  2. 200 3D Modeling Exercises
  3. Assembly Projects with 150+ Part Drawings
- ❖ This book is a practice workbook. It does not include step-by-step tutorials for creating 2D drawing, 3D models and Assembly.
- ❖ SI units (millimeters) are used for all dimensions.
- ❖ Third Angle Projection is used throughout this book.
- ❖ This book is for **DesignSpark Mechanical** and also suitable for Other Feature-Based Modeling Software such as SolidWorks, Catia, Fusion 360, NX, Solid Edge, AutoCAD, PTC Creo etc.
- ❖ Designed for students, engineers, drafters, and designers looking for extensive CAD practice using **DesignSpark Mechanical**.
- ❖ The exercises cover a wide range of real-world modeling challenges—from simple sketches to complex assemblies—offering clear, concise, and structured drawing practice.
- ❖ Exercises are organized to gradually develop beginner to advanced-level design skills.
- ❖ Each exercise is self-contained, and can be completed independently.
- ❖ Assembly drawings follow industry standards to help improve visualization and multi-part modeling skills.
- ❖ All dimensions are in mm. Assume missing dimensions logically.

## HOW TO USE THIS BOOK

This book contains over 500 CAD practice exercises, designed for self-paced learning using **DesignSpark Mechanical** or any feature-based modeling software.

- 2D Sketching Exercises: Start here if you're a beginner or learning how to use the sketch environment.
- 3D Modeling Exercises: Follow after mastering sketching. Practice creating solid models using the provided dimensions.
- Assembly Drawings: Use after completing part models to understand multi-part assemblies, relationships, and constraints.

### Tips for Best Use:

- Complete the exercises in order, or jump to any skill level you prefer.
- All dimensions are in millimeters.
- Where dimensions are missing, apply logic or practice estimation.
- This book is ideal for both students and professionals preparing for industry design work.

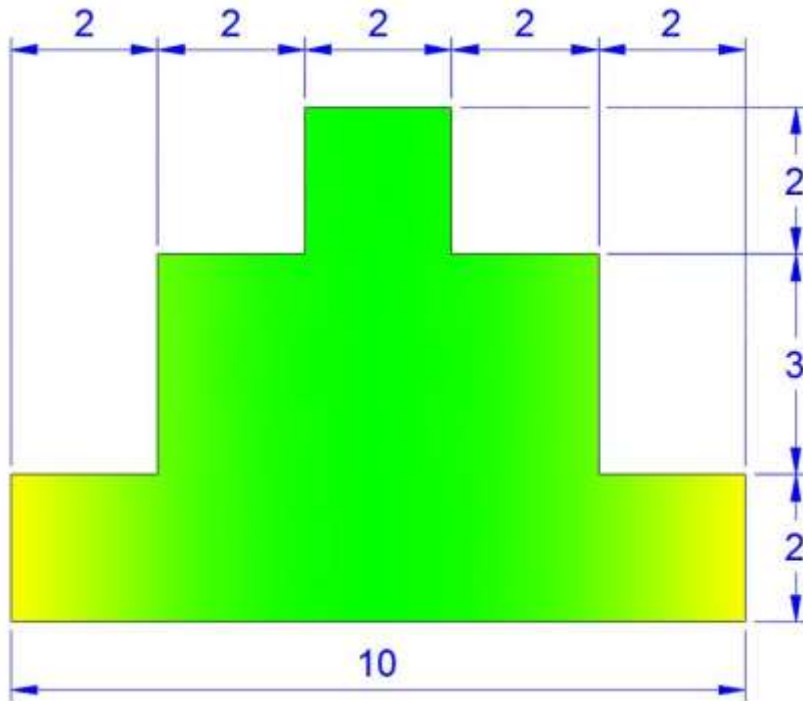
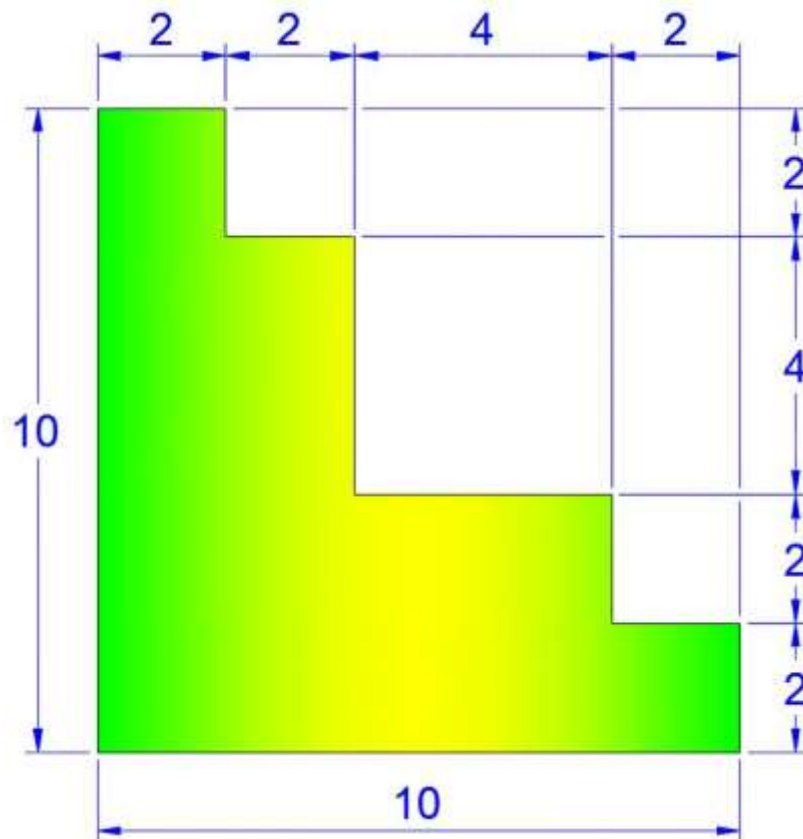
### Note:

This book is available in multiple formats – **Black & White**, **Standard Color**, and **Premium Color** editions.

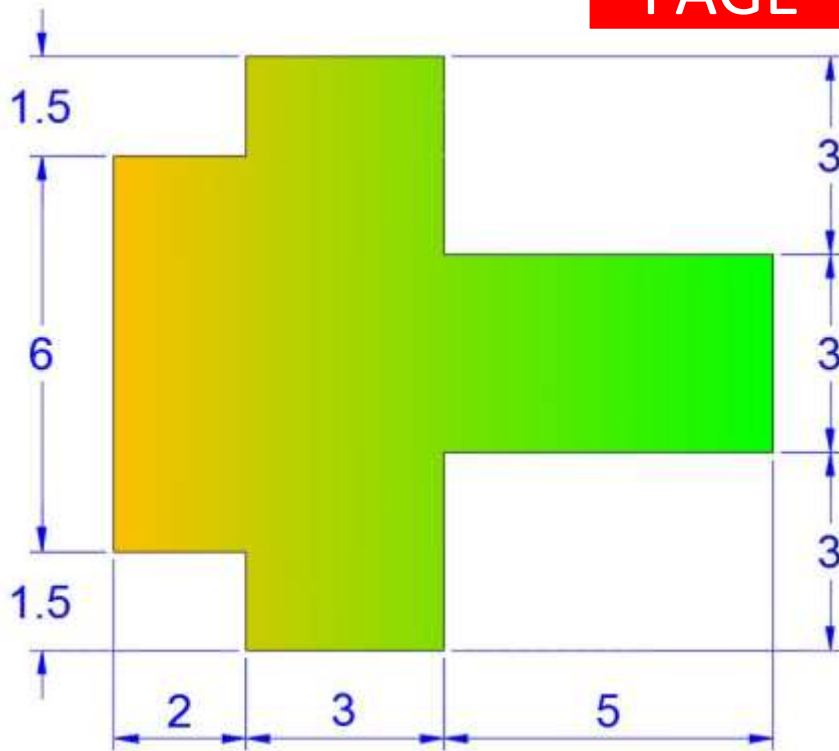
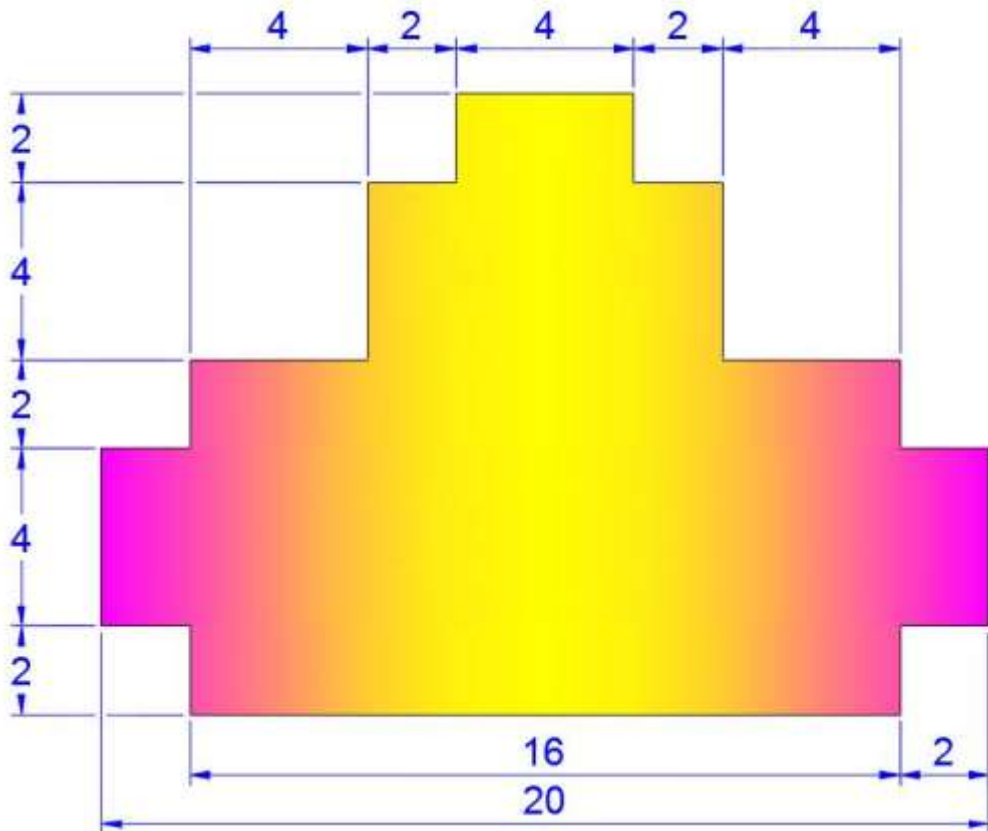
Happy learning!  
– Team CADIN360

# 2D

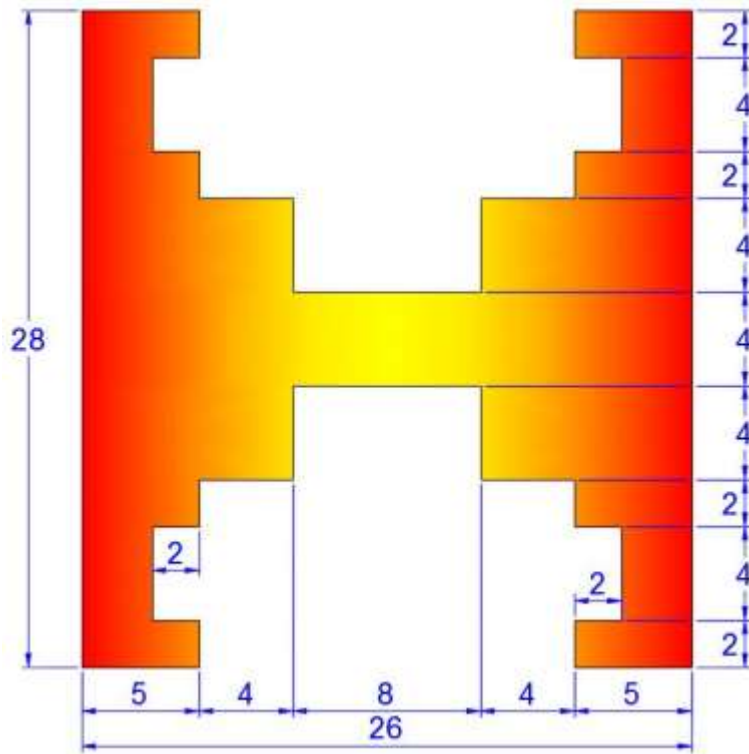
# SKETCHING

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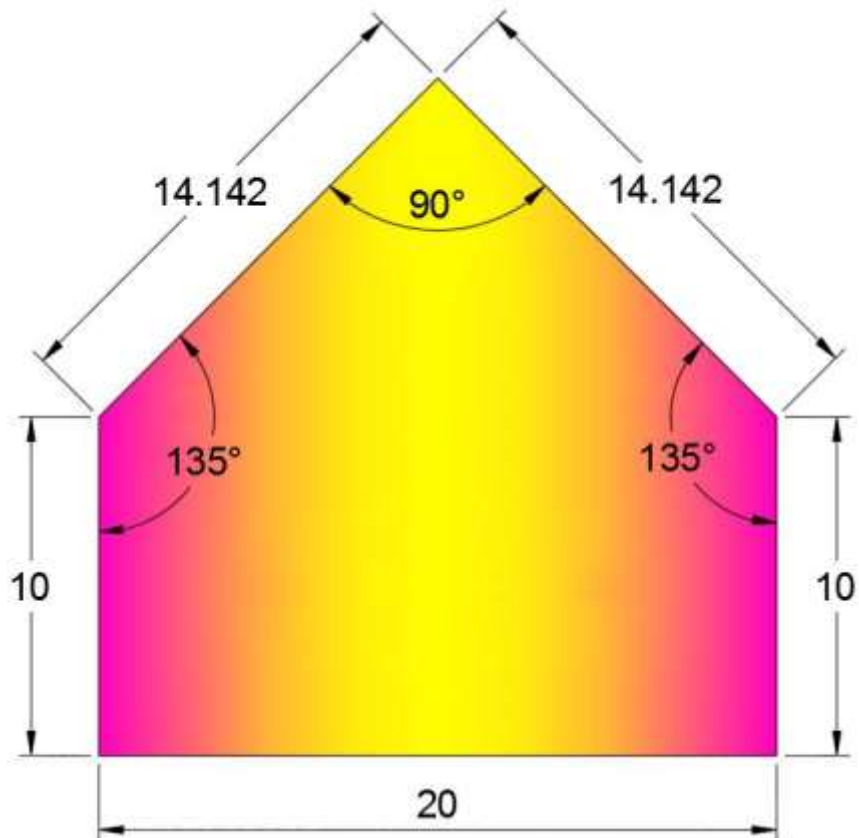


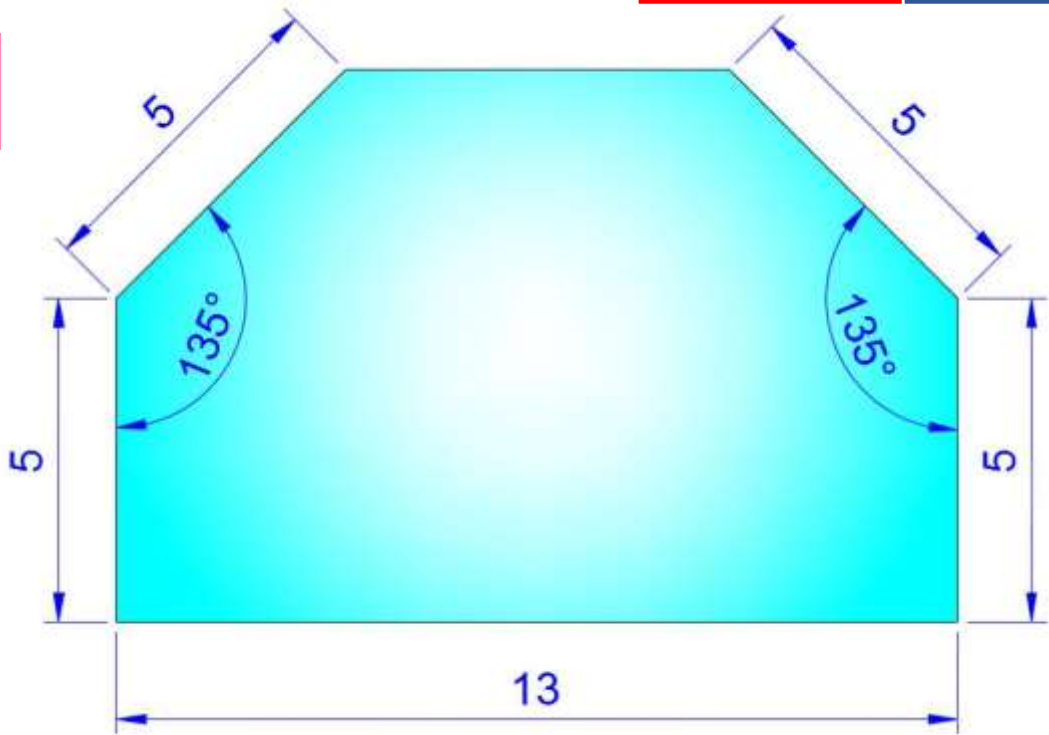
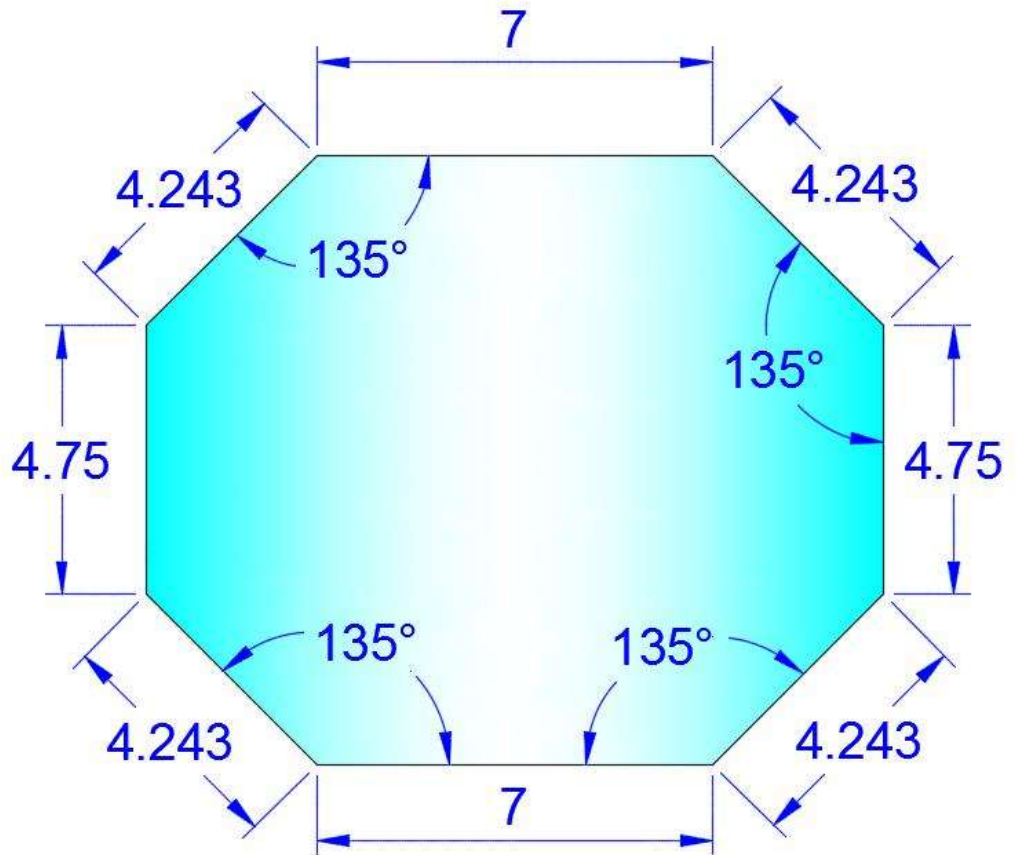
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EX-05

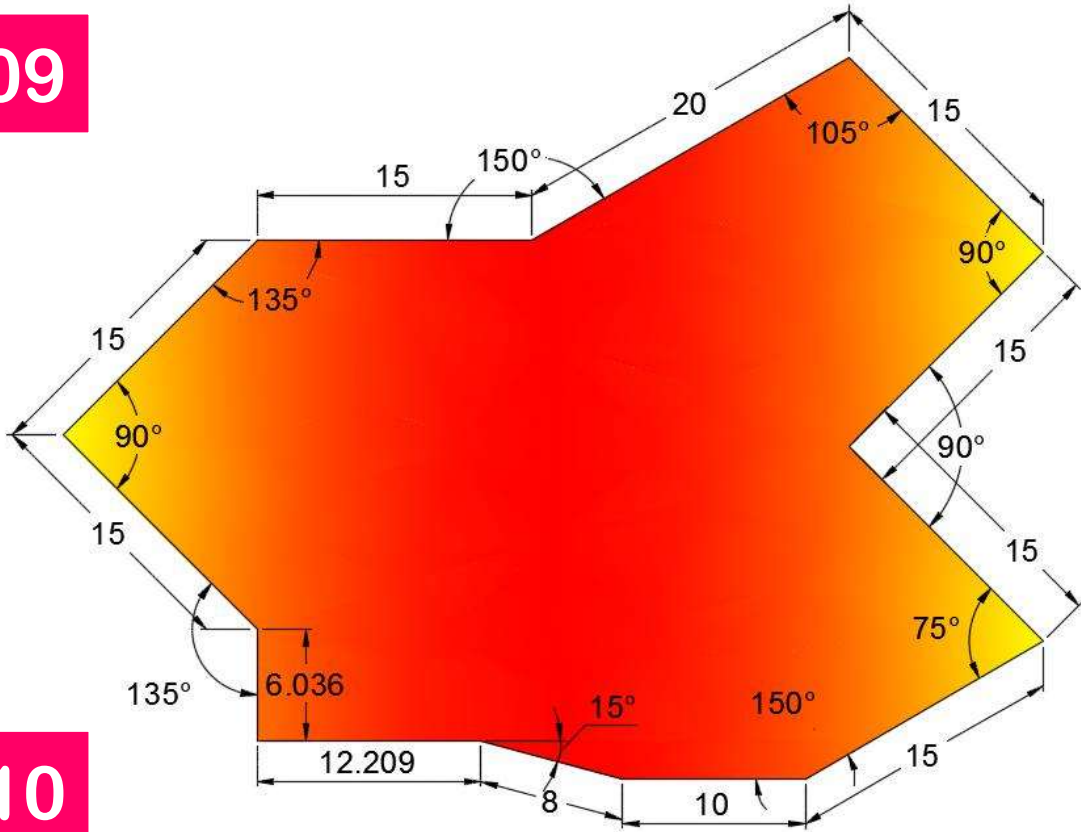


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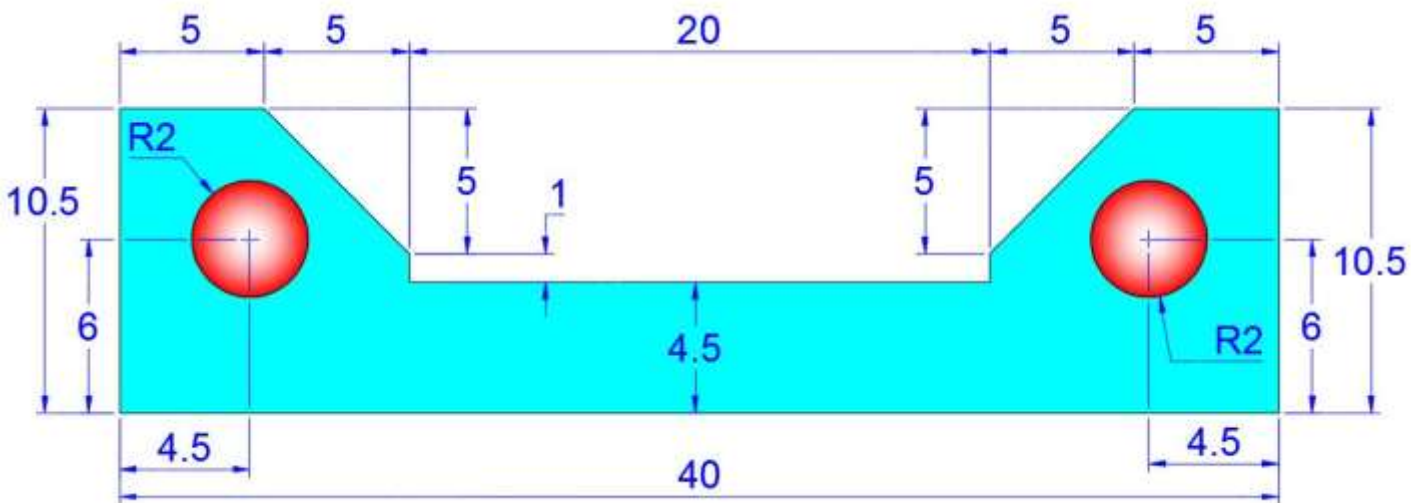


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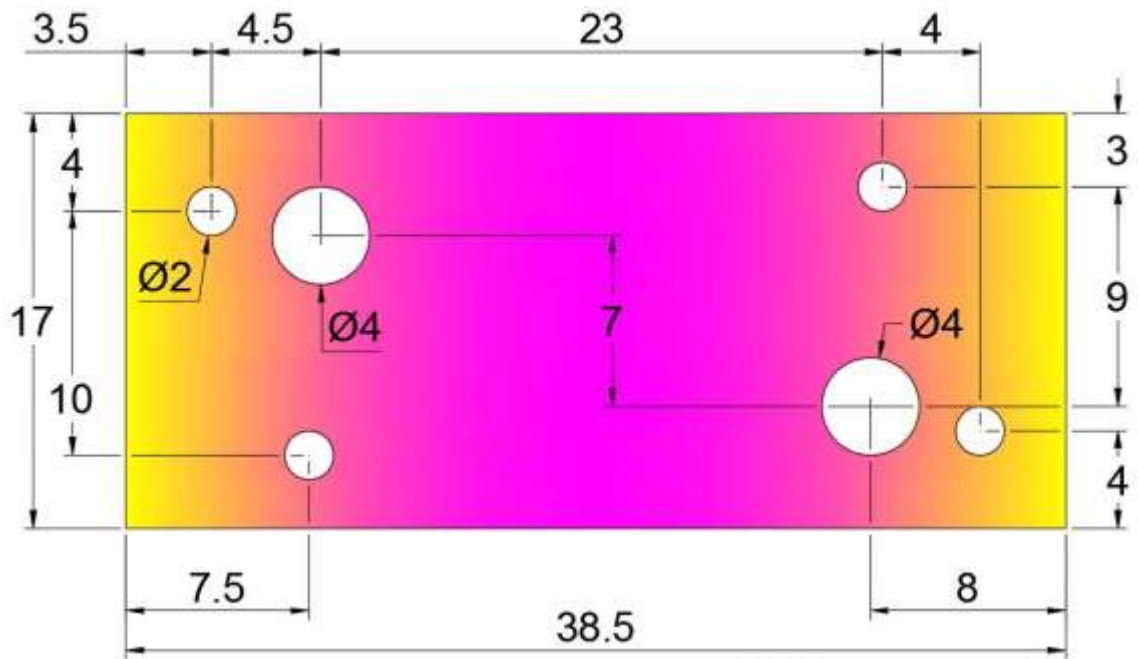
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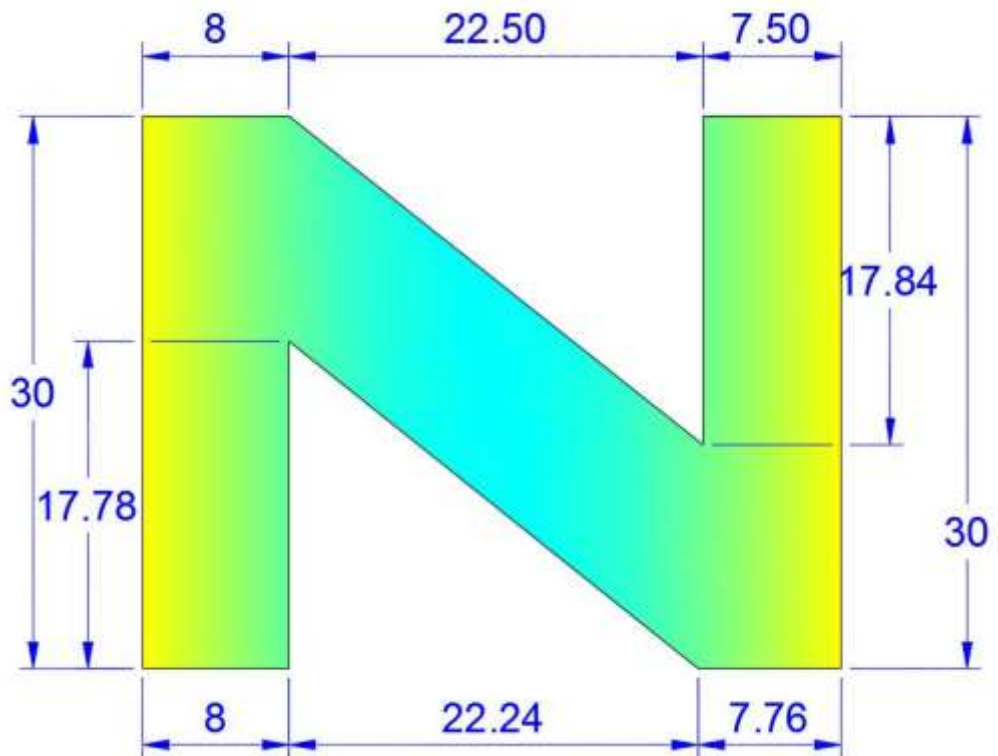
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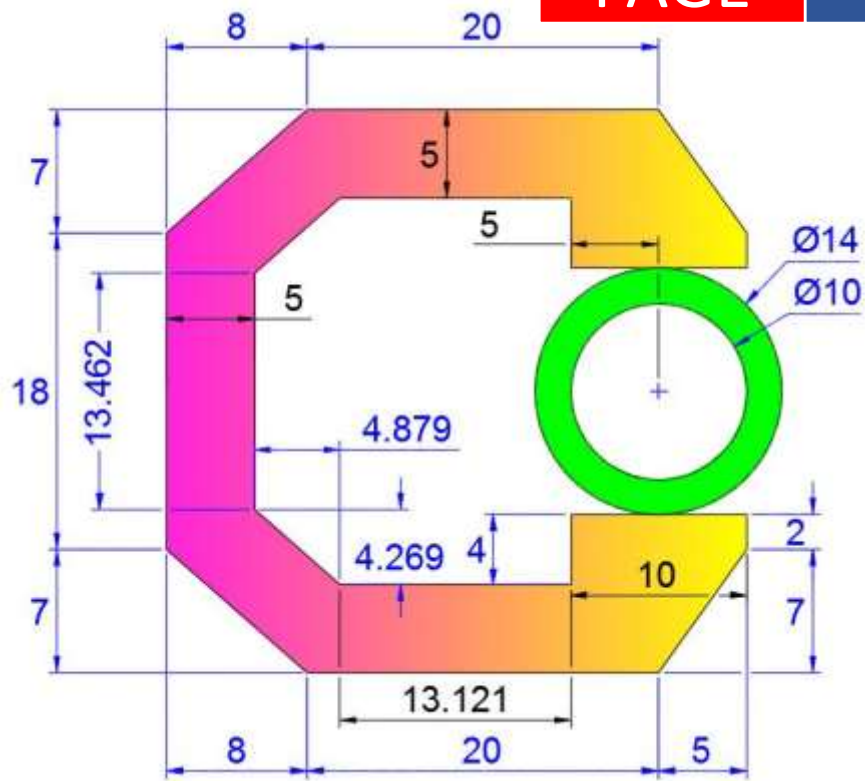
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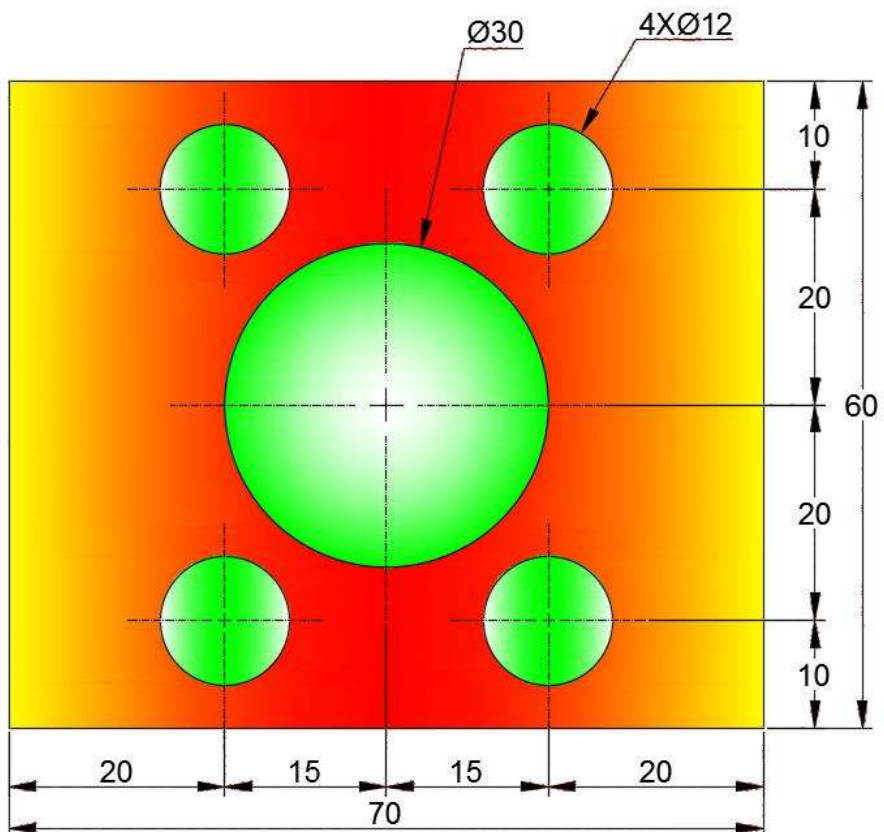
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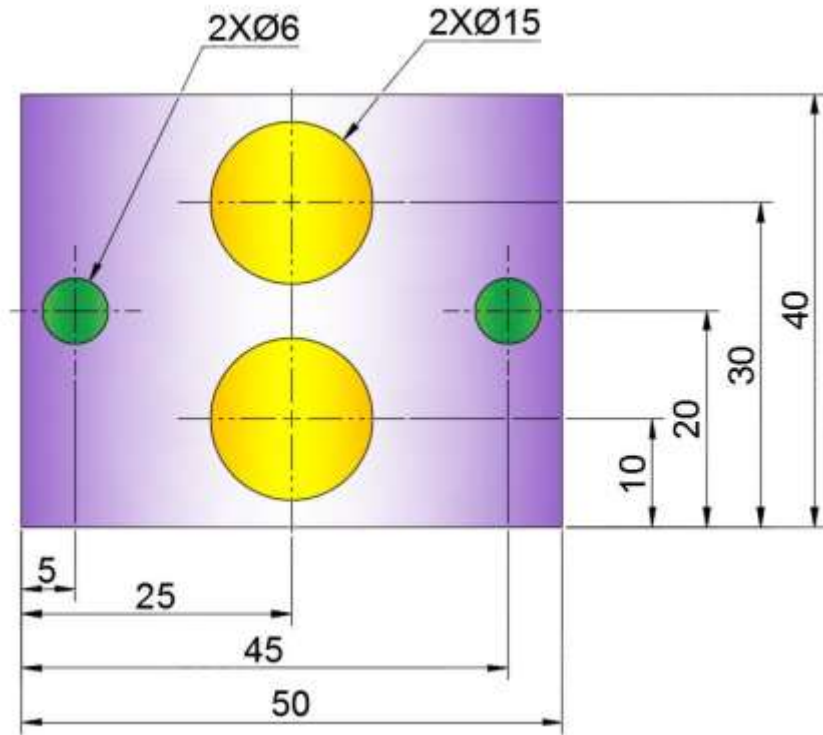
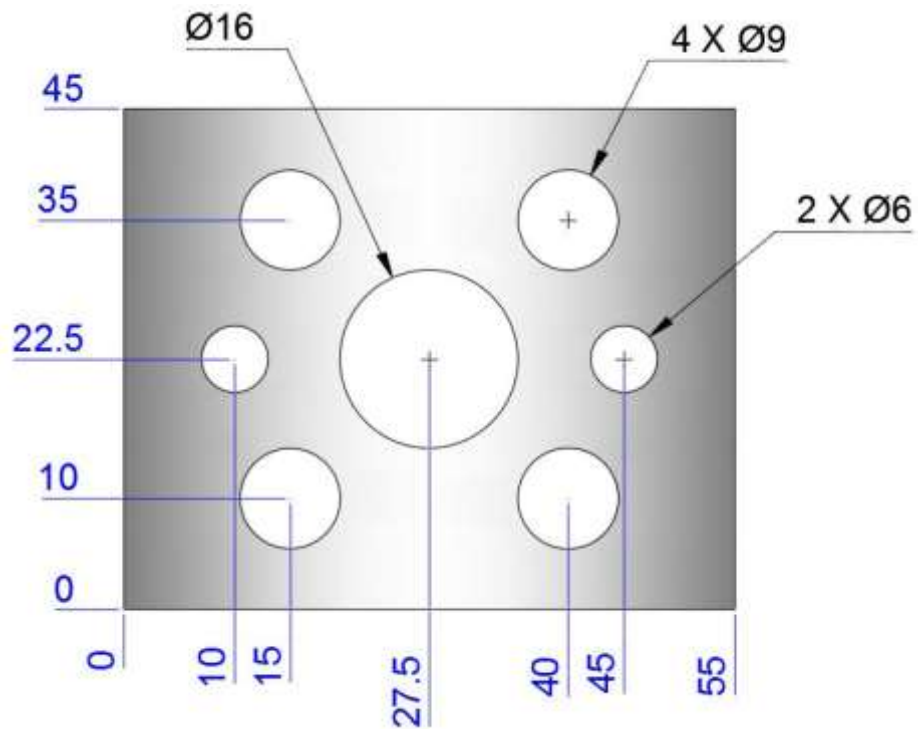


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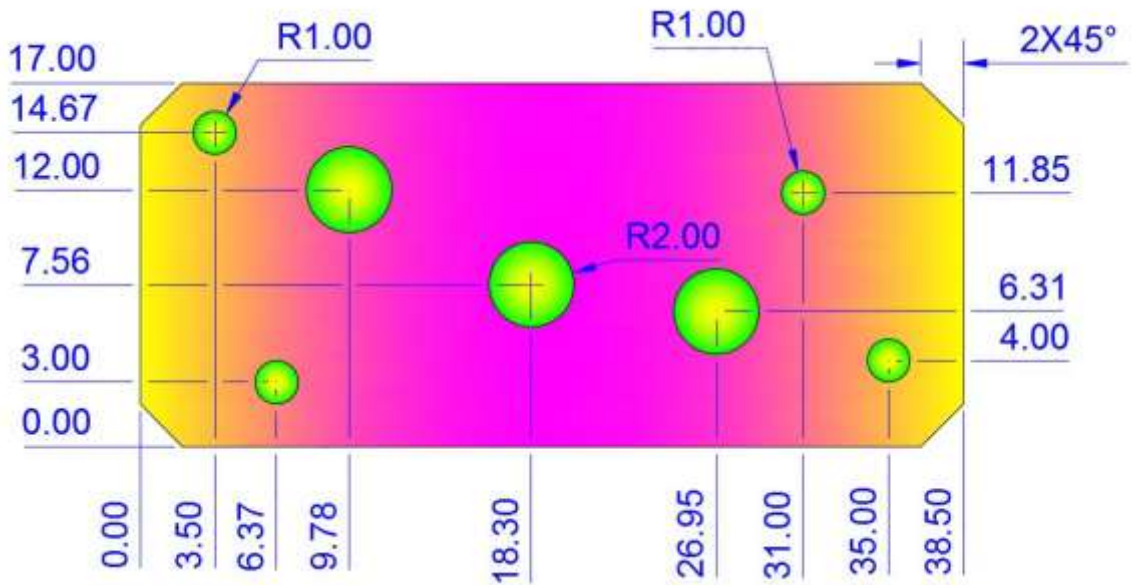
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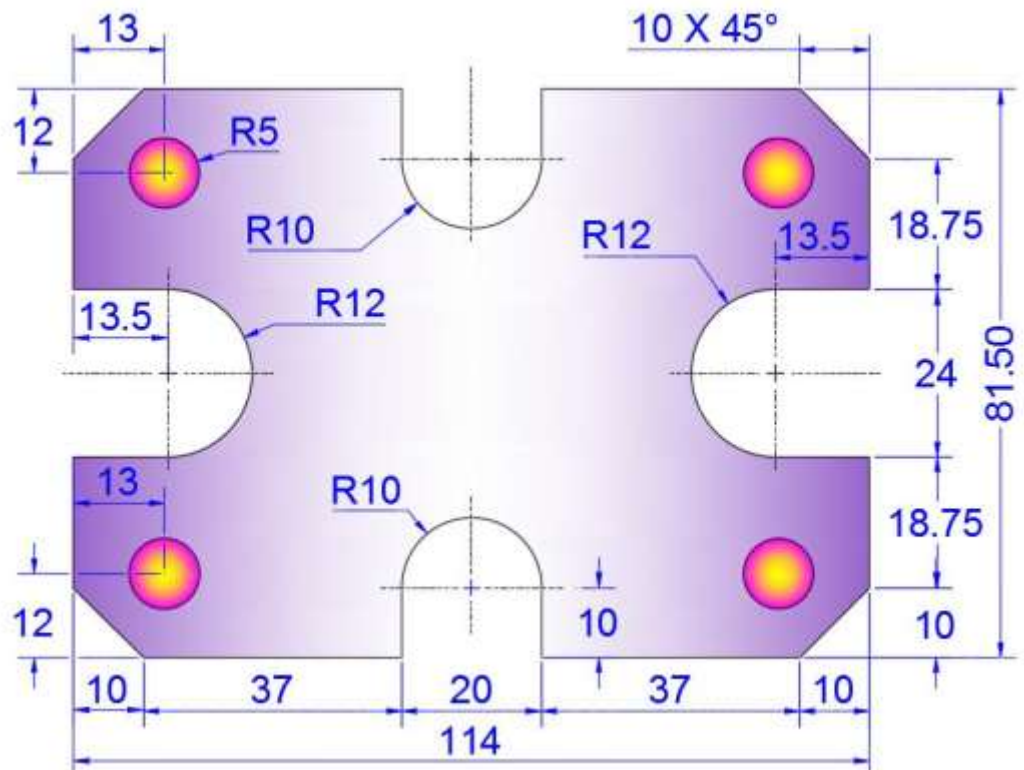
**EX-15****EX-16**



## EX-17

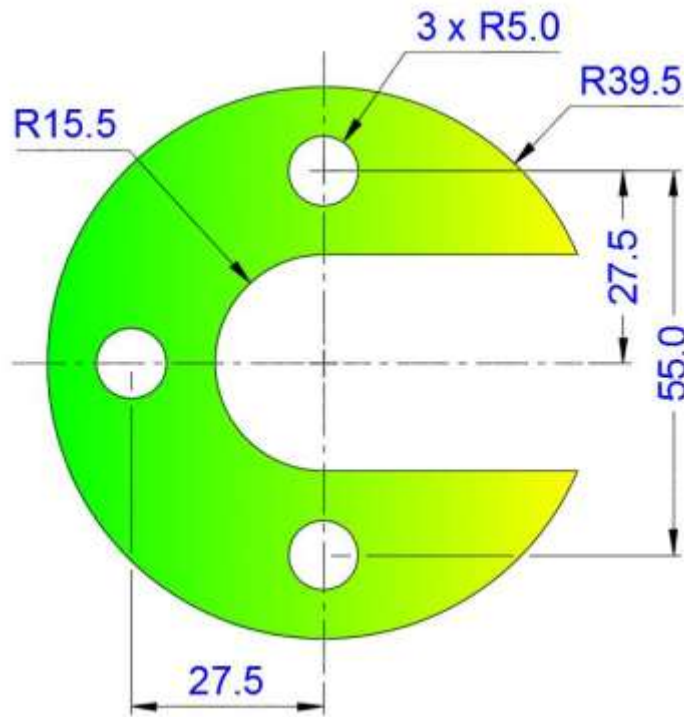


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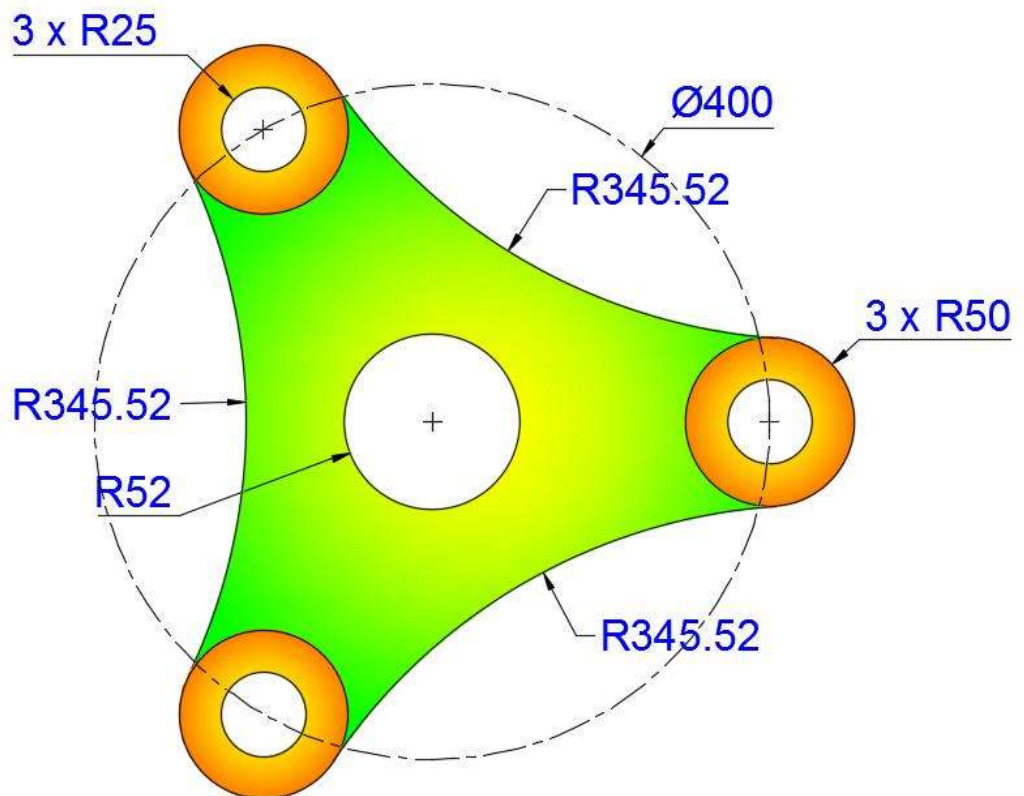




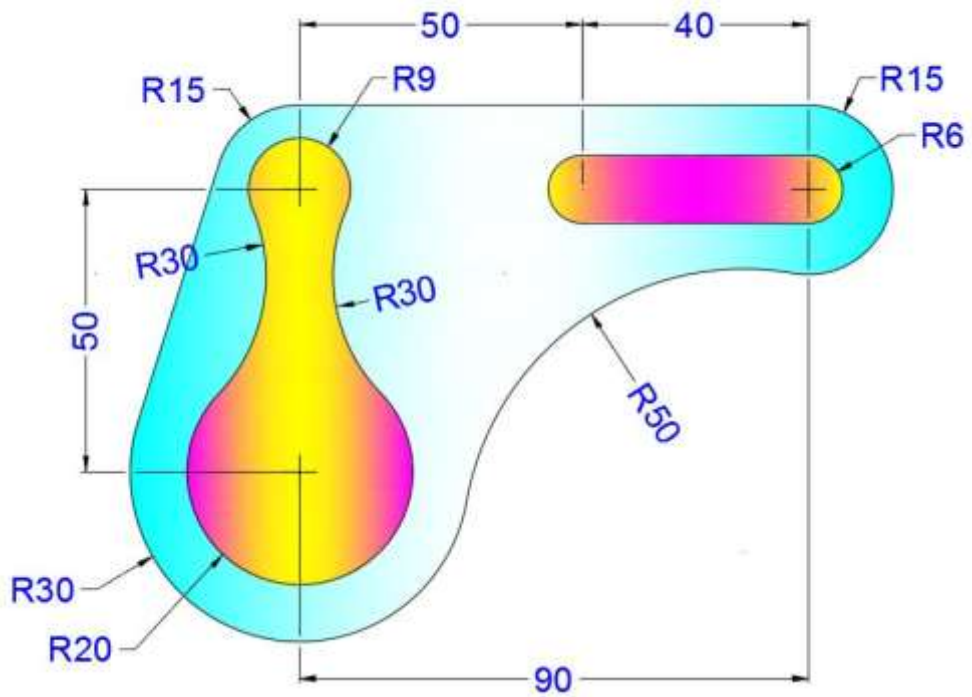
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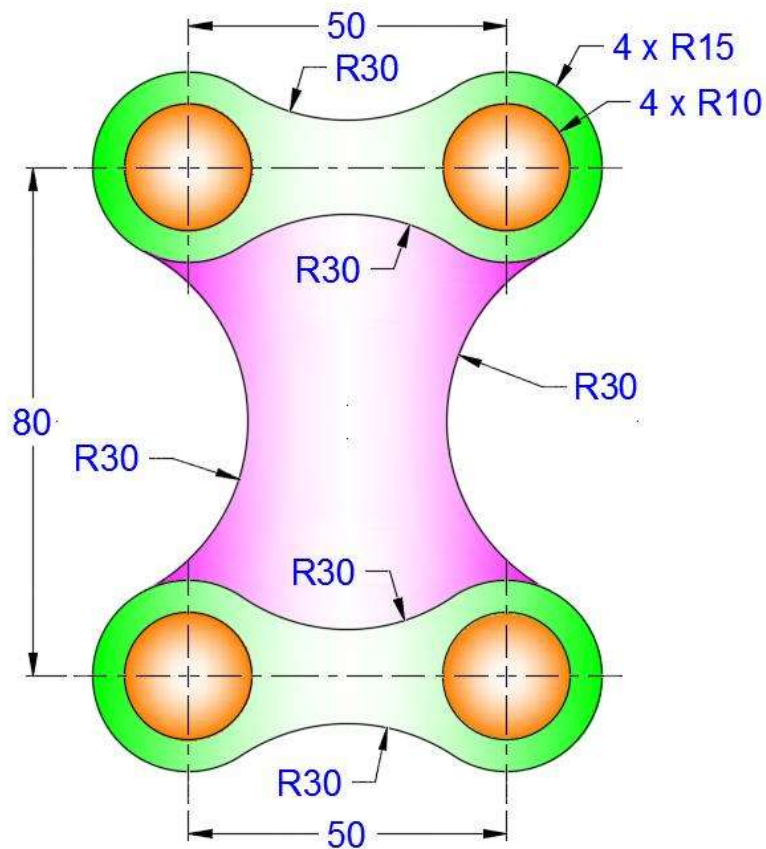
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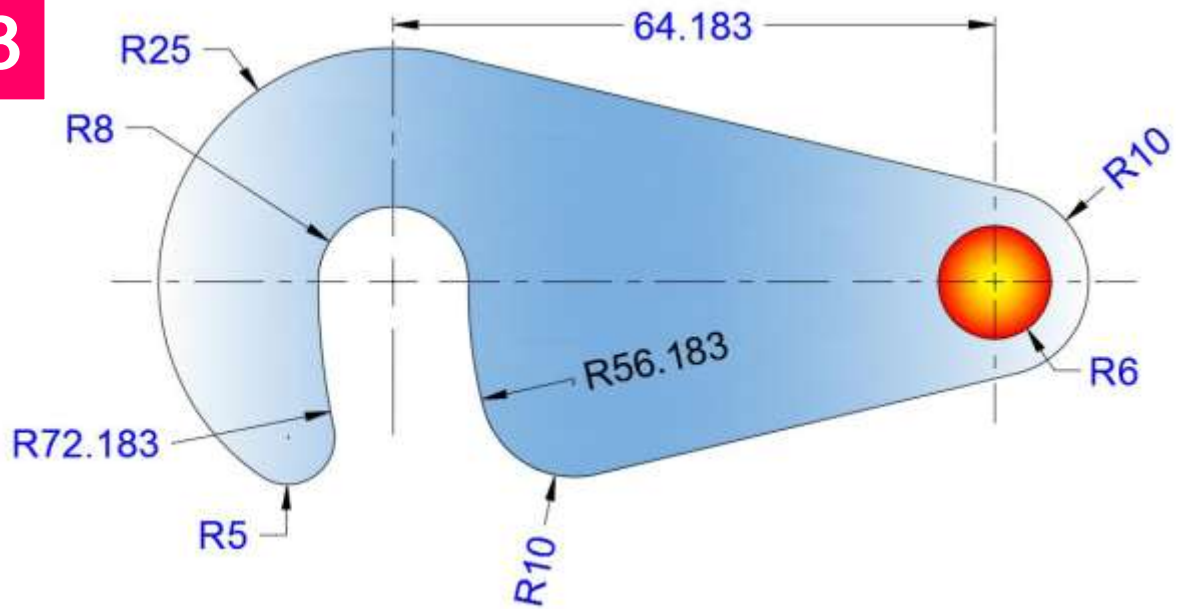
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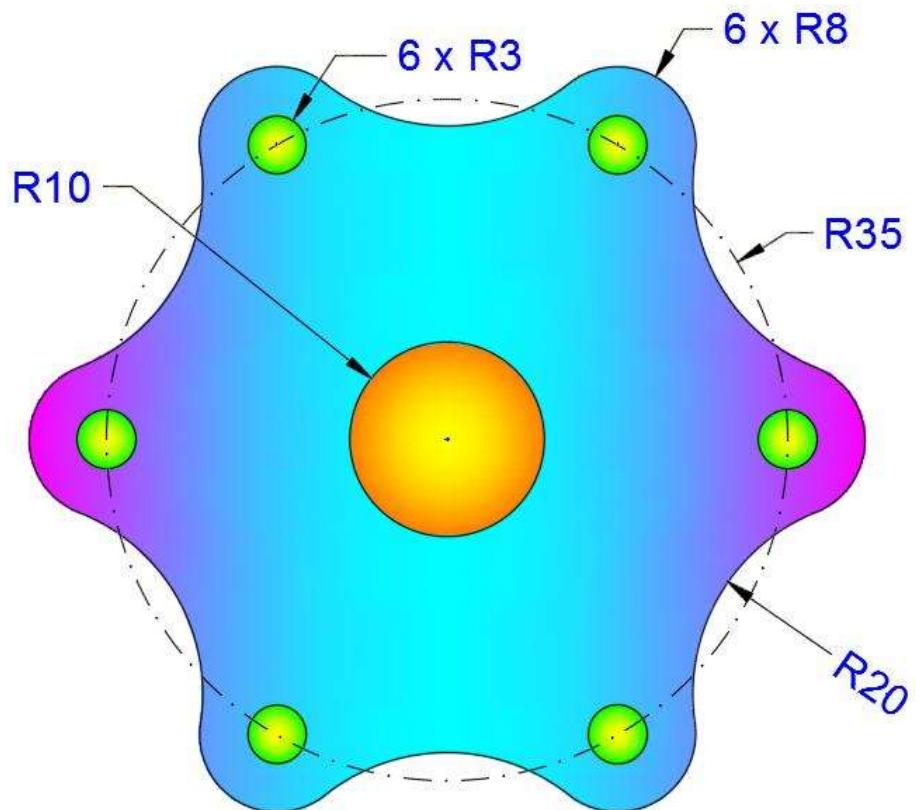
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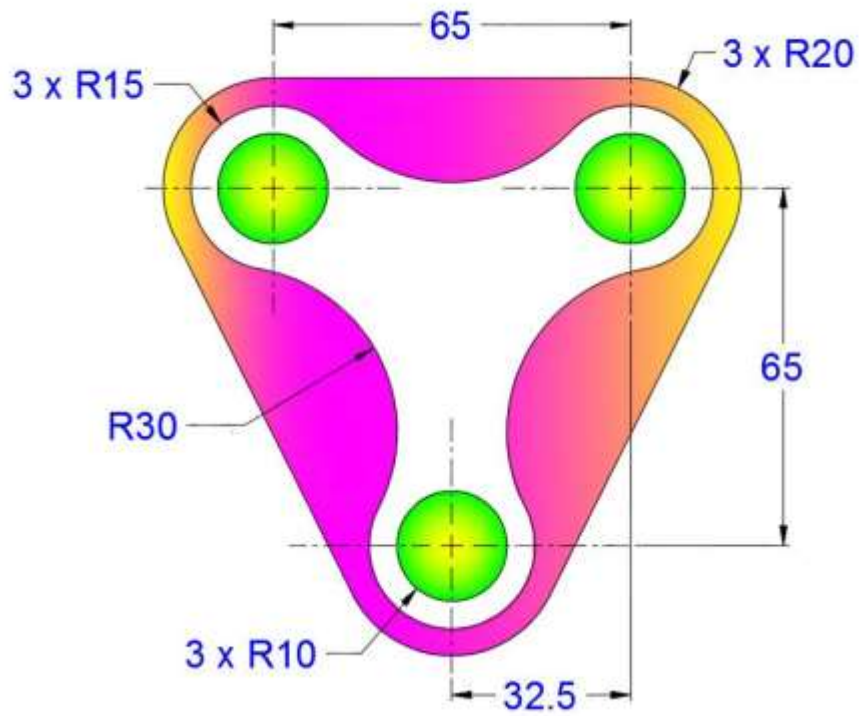
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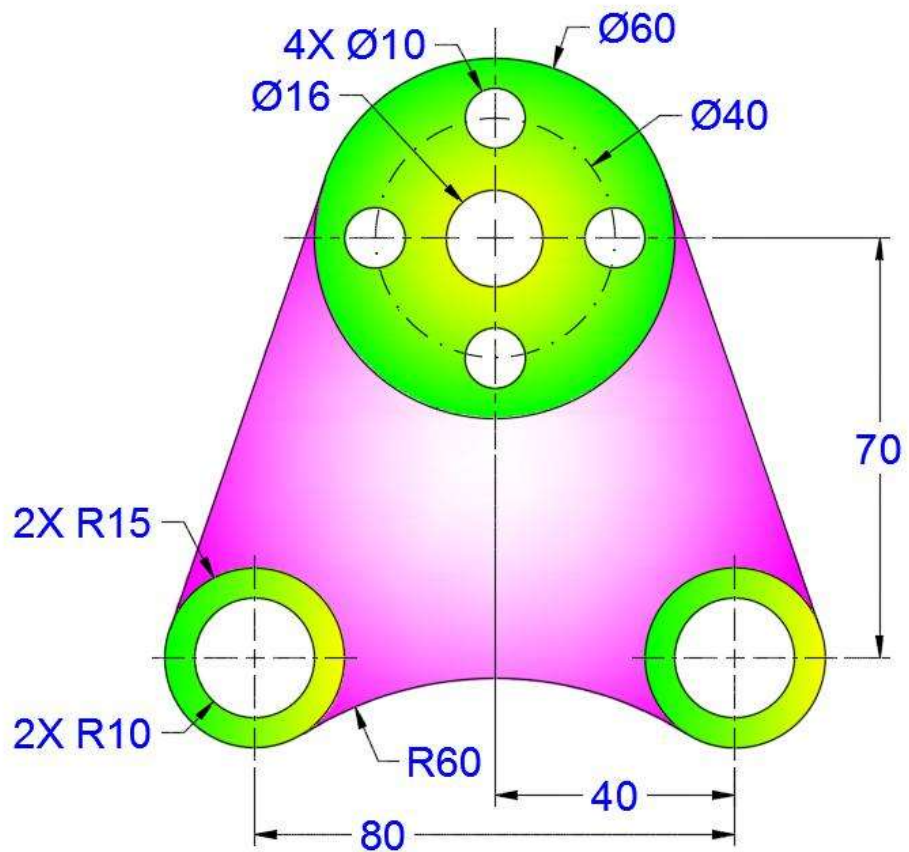
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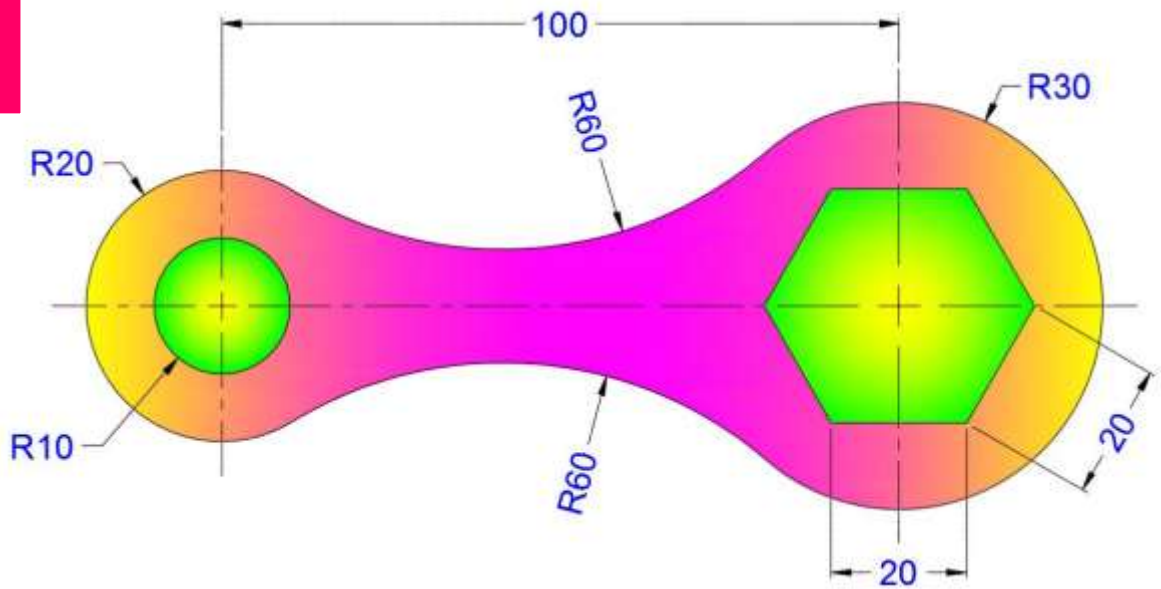
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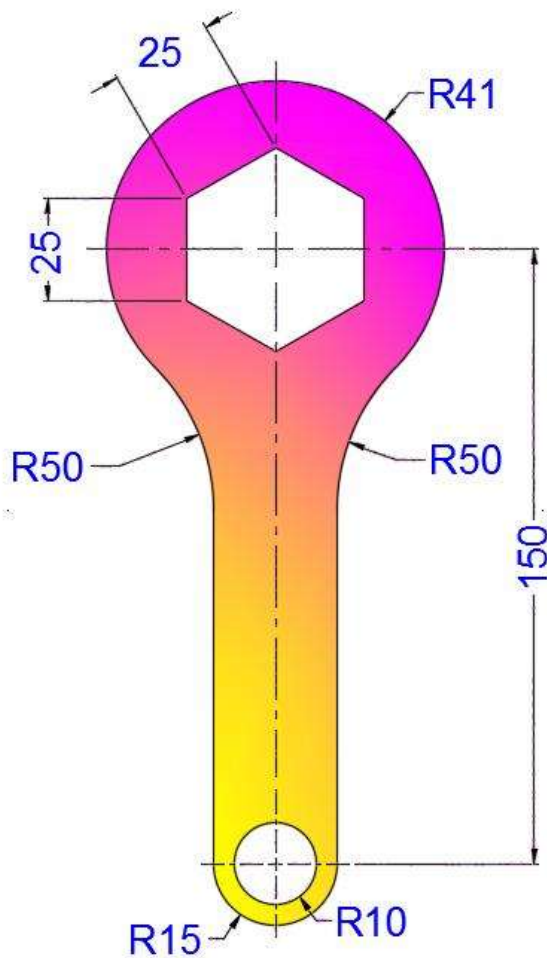
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EX-27

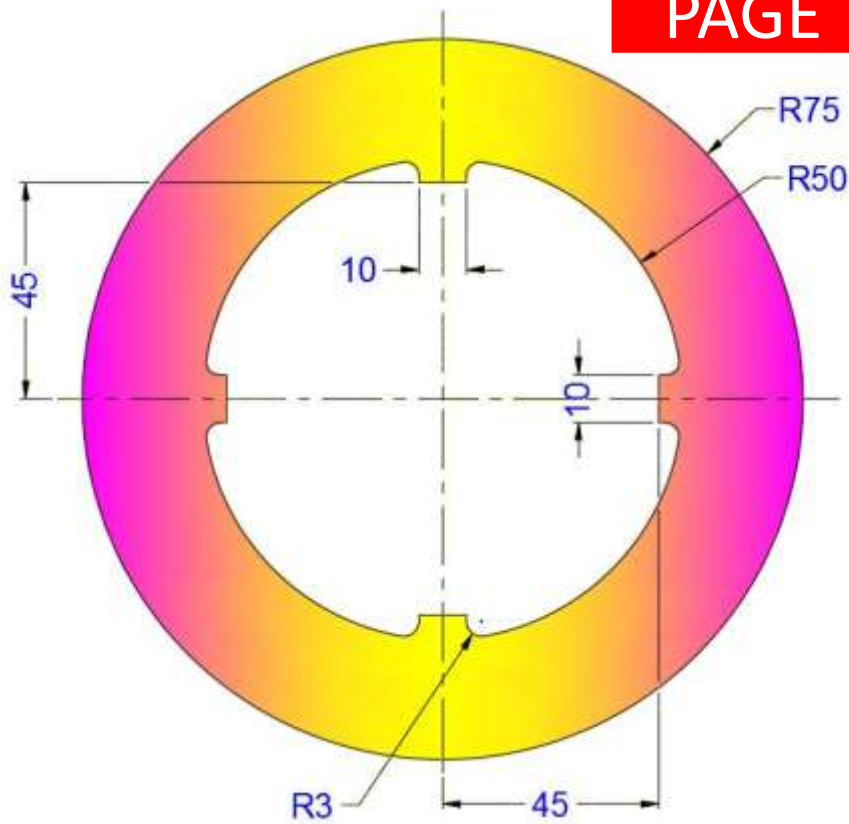


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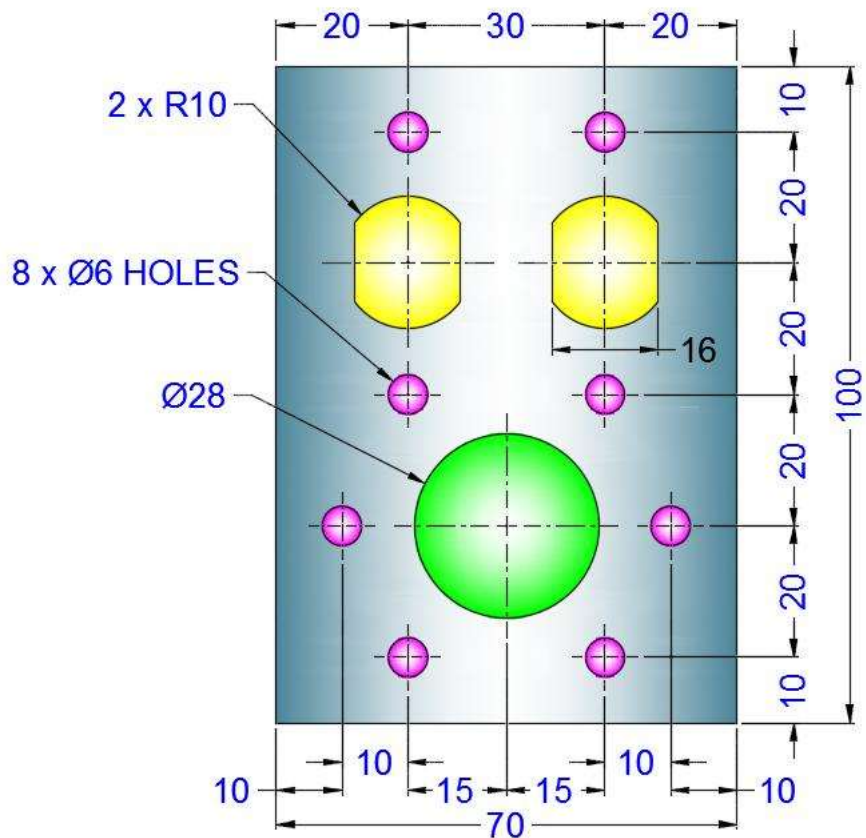




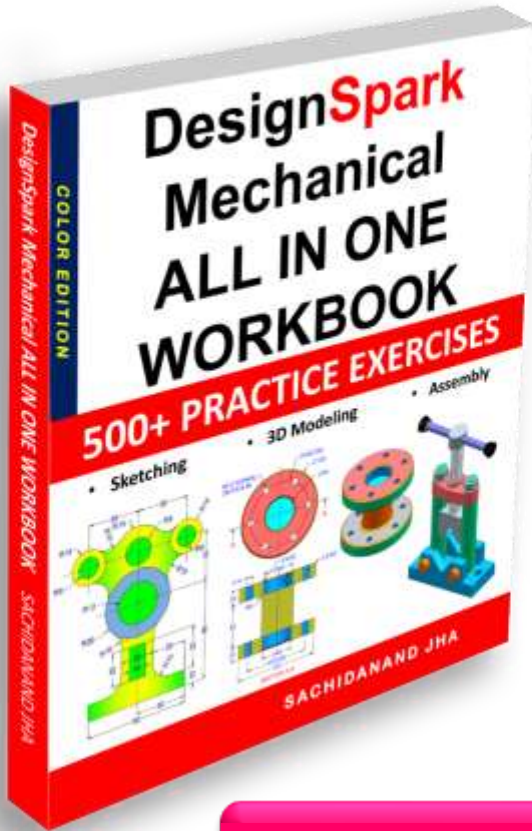
EX-29



EX-30



# END OF 2D SAMPLE



## What's Included in the **DESIGNSPARK ALL IN ONE WORKBOOK?**

- ✓ Books contains exercises of Sketching, 3D Modeling & Assembly.
- ✓ 500+ Practice Exercises with Dimensions
- ✓ Full Assembly STEP Files (.stp format) – Compatible with all major CAD software
- ✓ Instant Download Link - Sent to Your Email After Payment
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# Transition to 3D Modeling – Let's Build in 3D!

Great job completing the **2D Sketching** section!

You've practiced 2D geometry and dimensioning, and now it's time to elevate your skills by modeling in 3D.

This section features 200 3D CAD exercises to help you visualize and create solid models from drawings.

## Why Practice 3D Modeling?

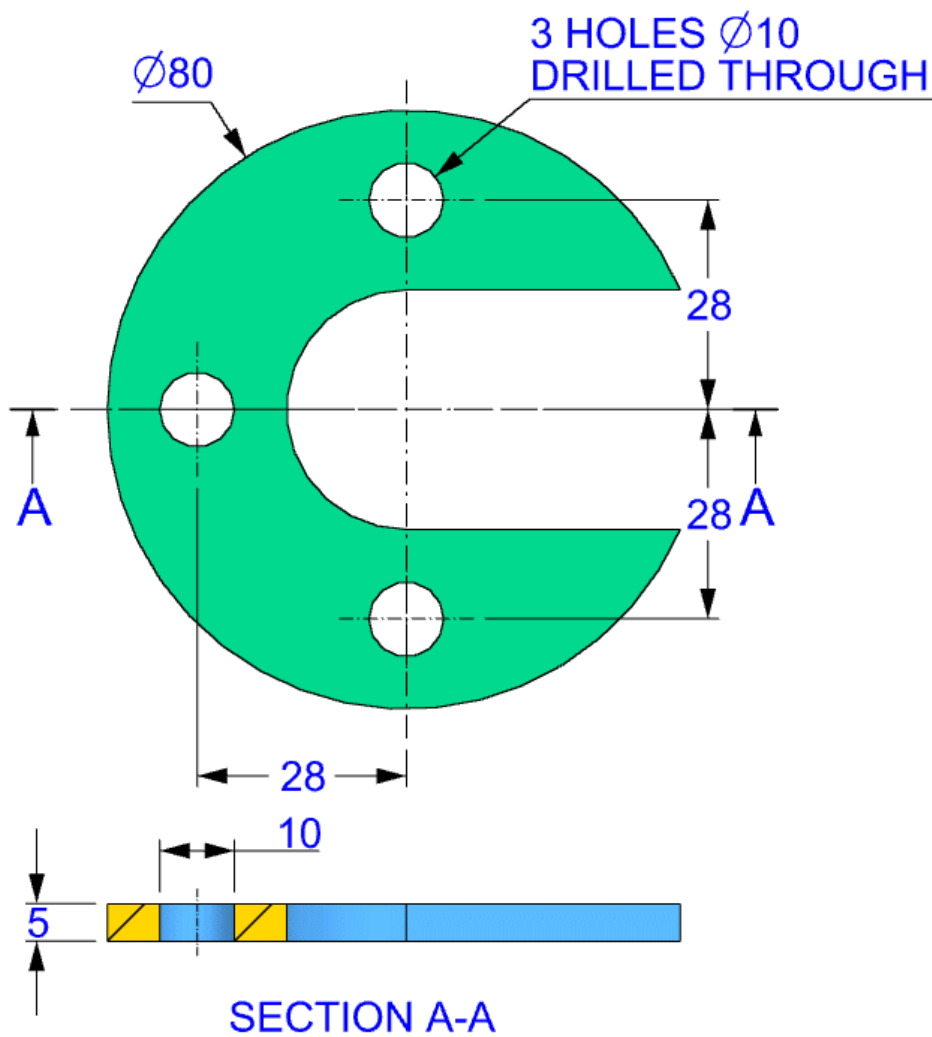
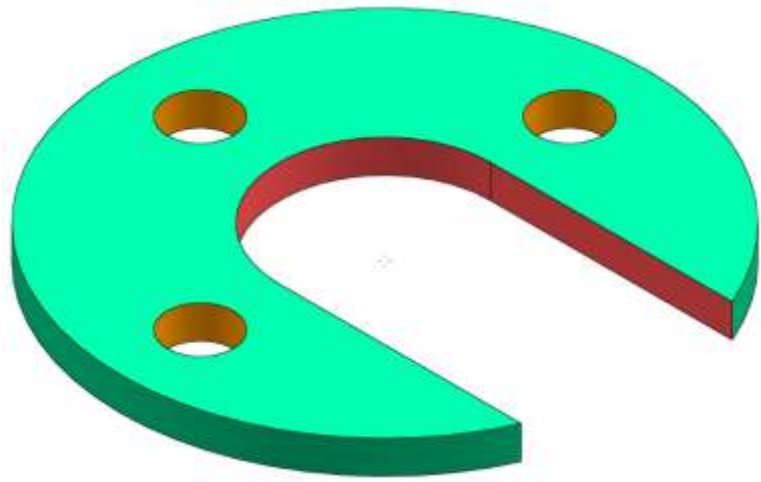
- Improve your spatial understanding and 3D design skills
- Learn how to build parts using provided views and dimensions
- Modify, redesign, or reuse these models for practice or projects
- Ideal for students, engineers, and 3D printing enthusiasts

Tip:

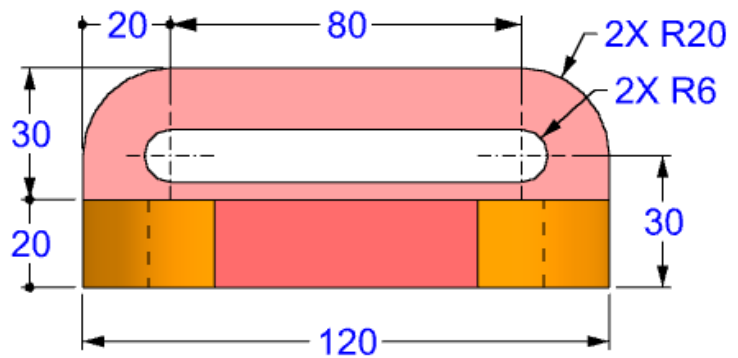
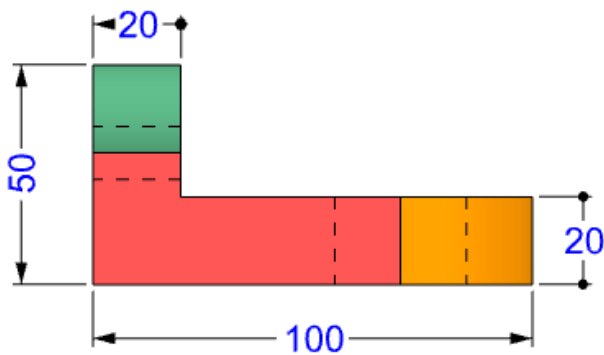
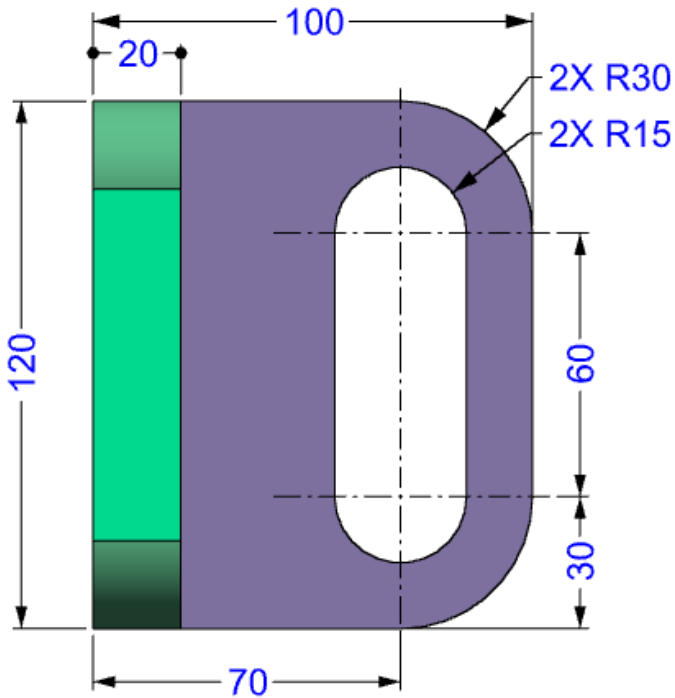
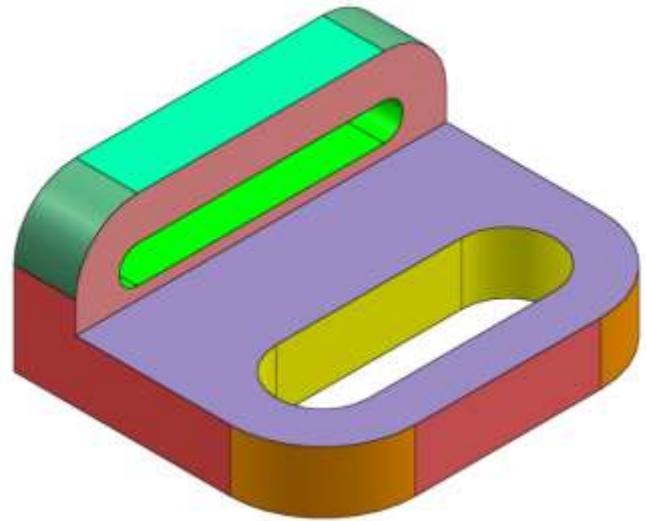
To get the best visual experience with shaded 3D shapes and colors, we recommend using the **Premium Color Edition** of this book.

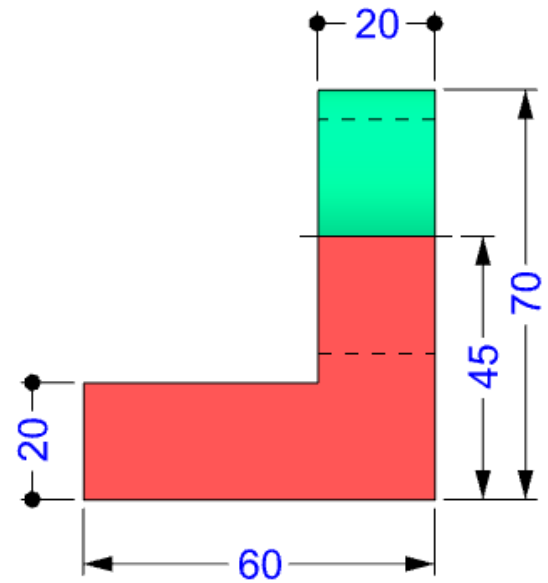
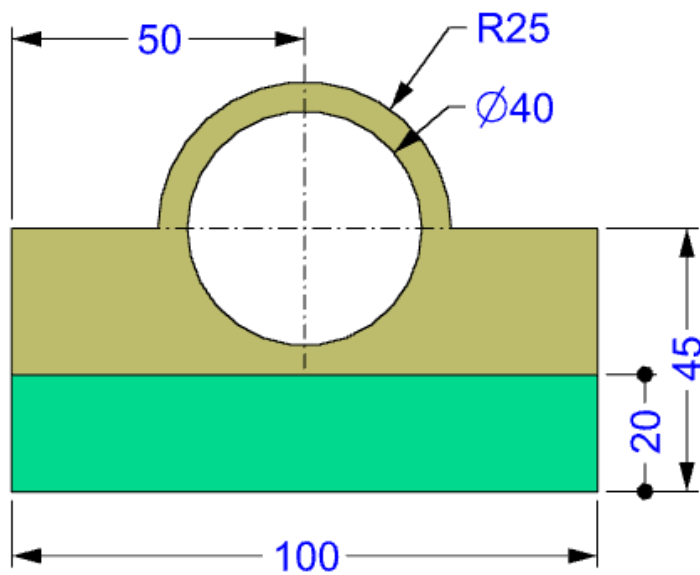
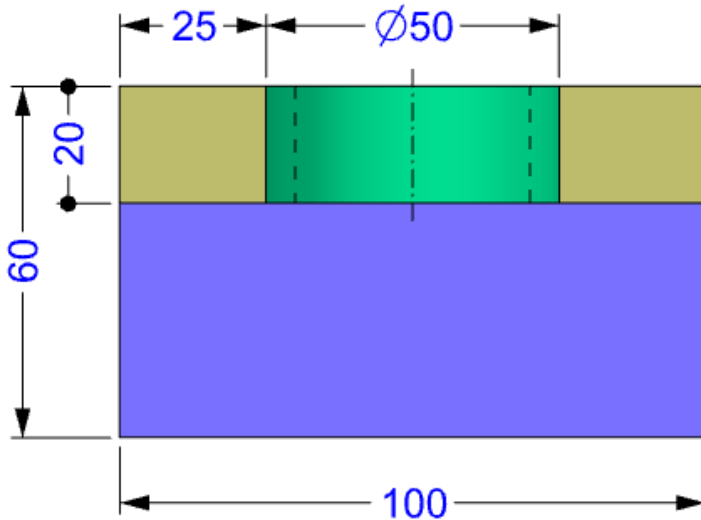
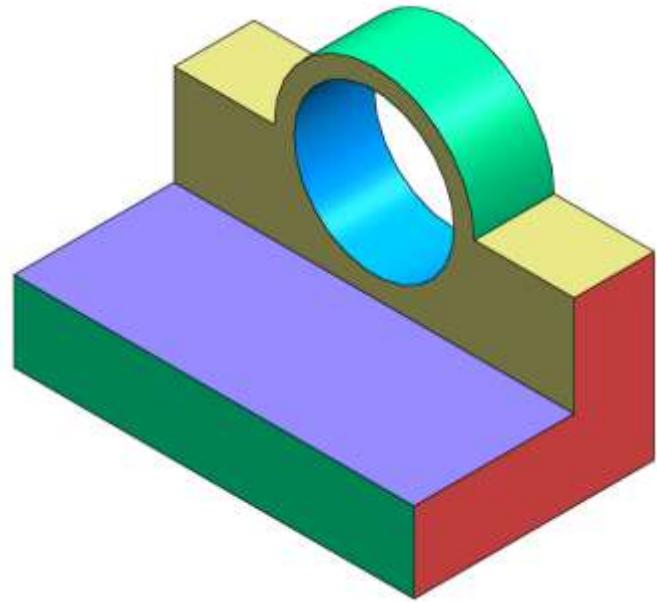
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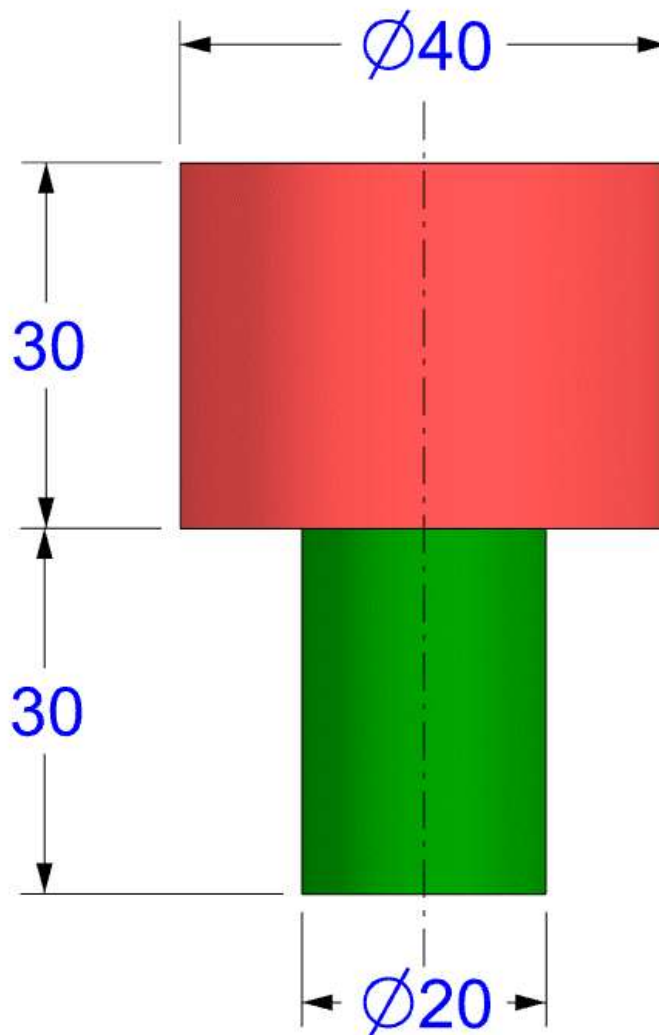
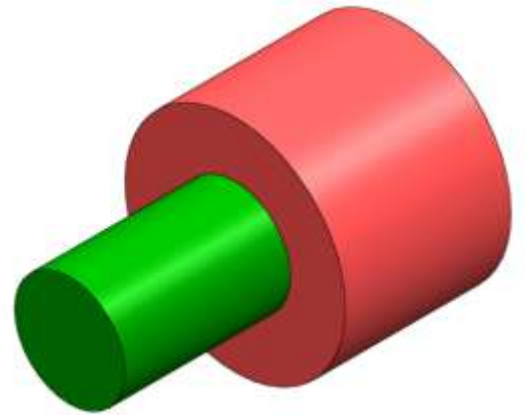


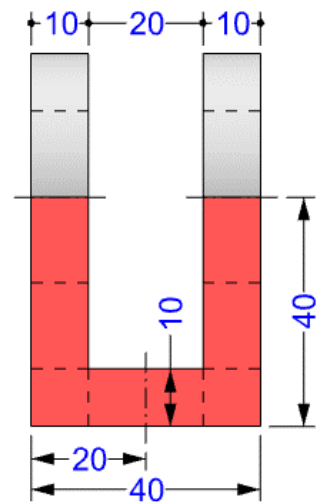
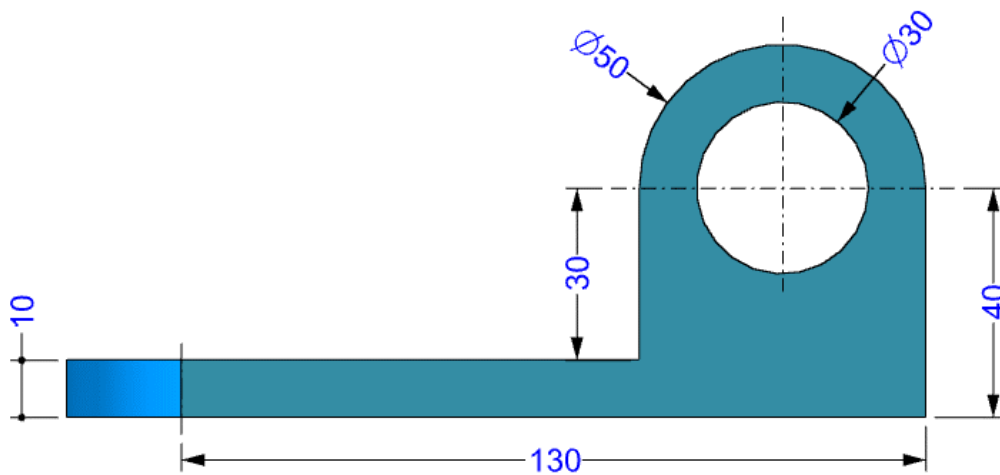
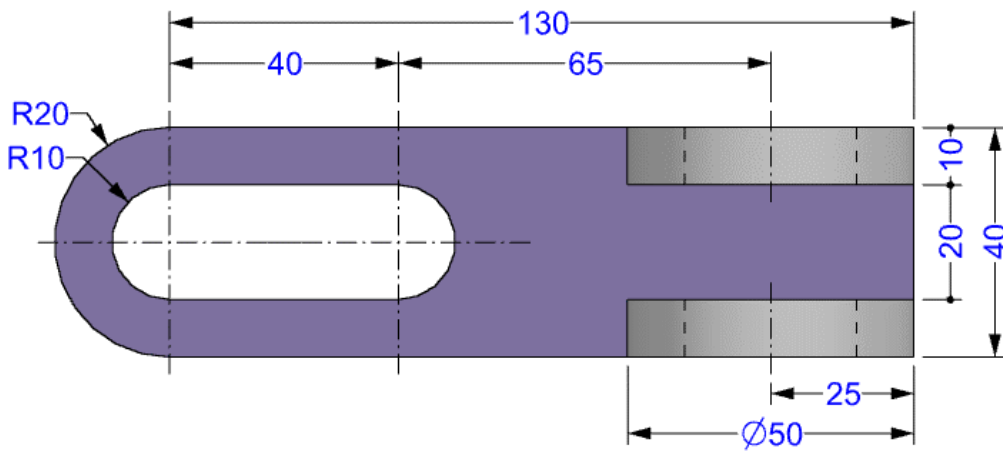
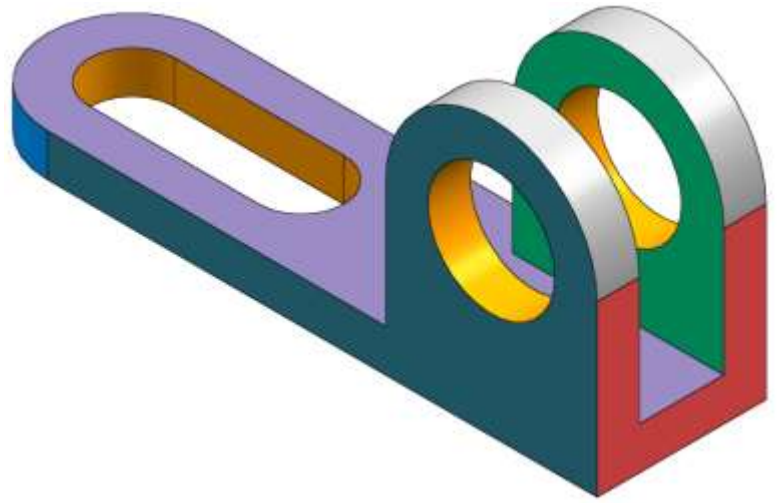
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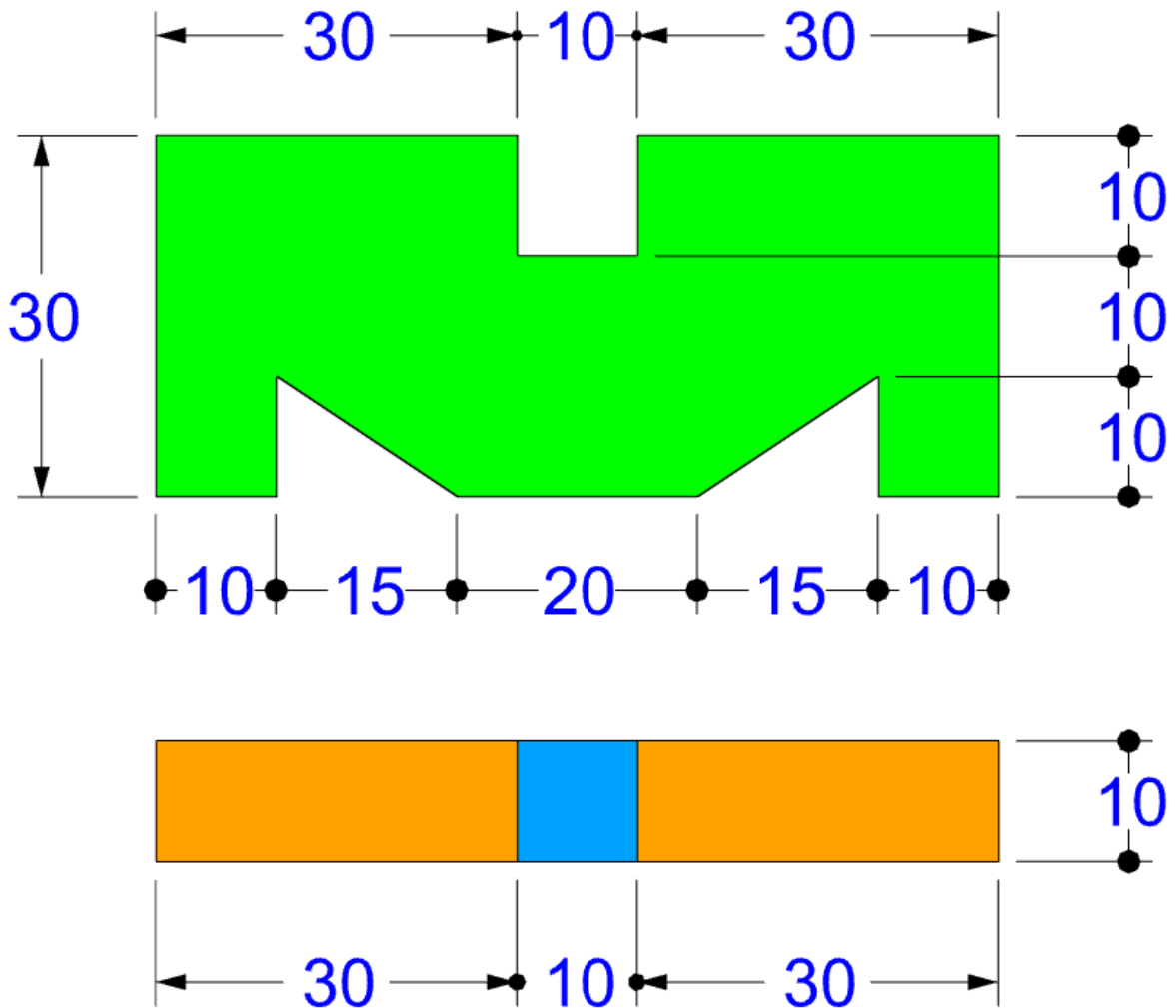
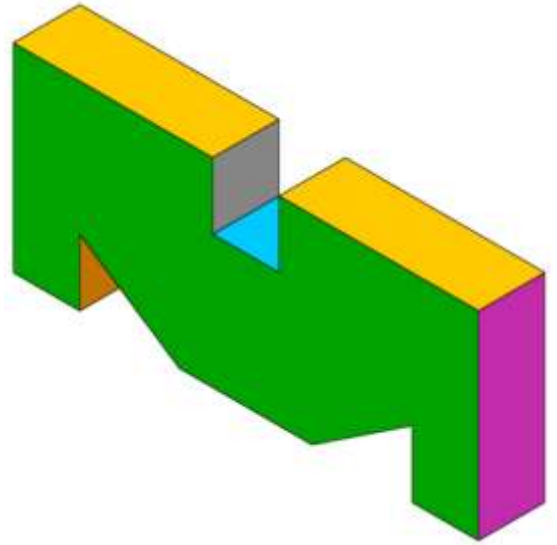
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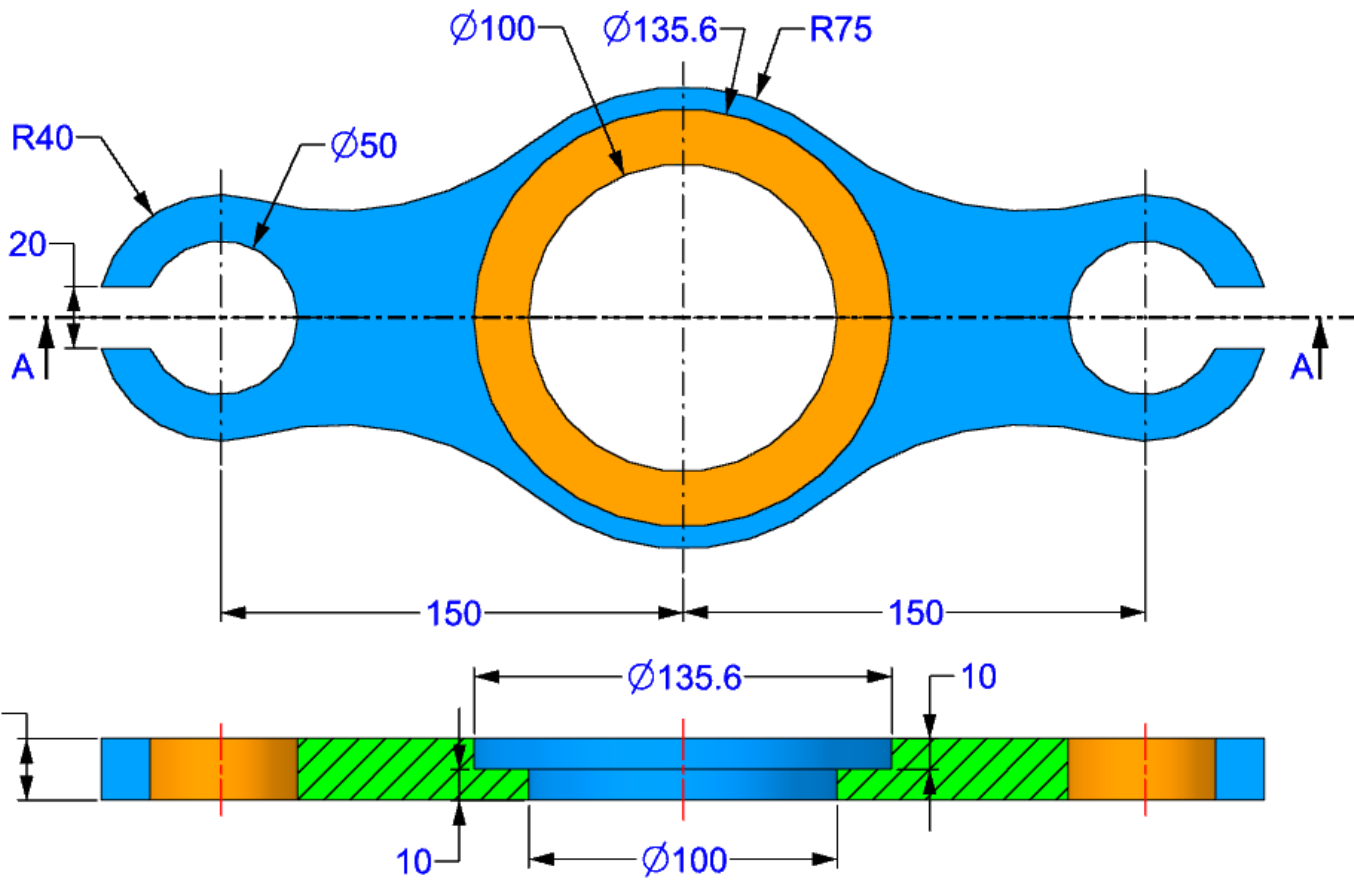


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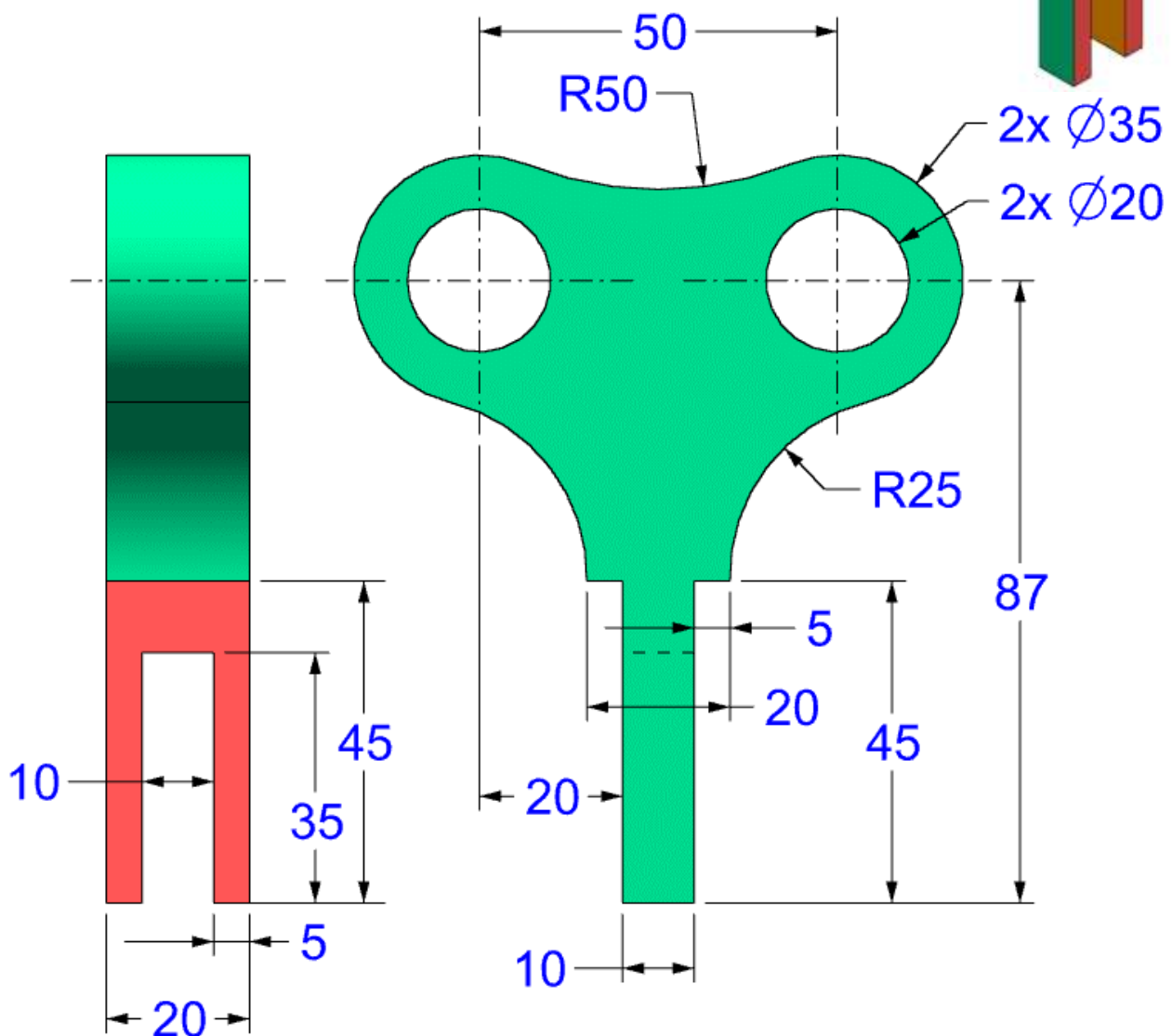
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**EXERCISE-05**

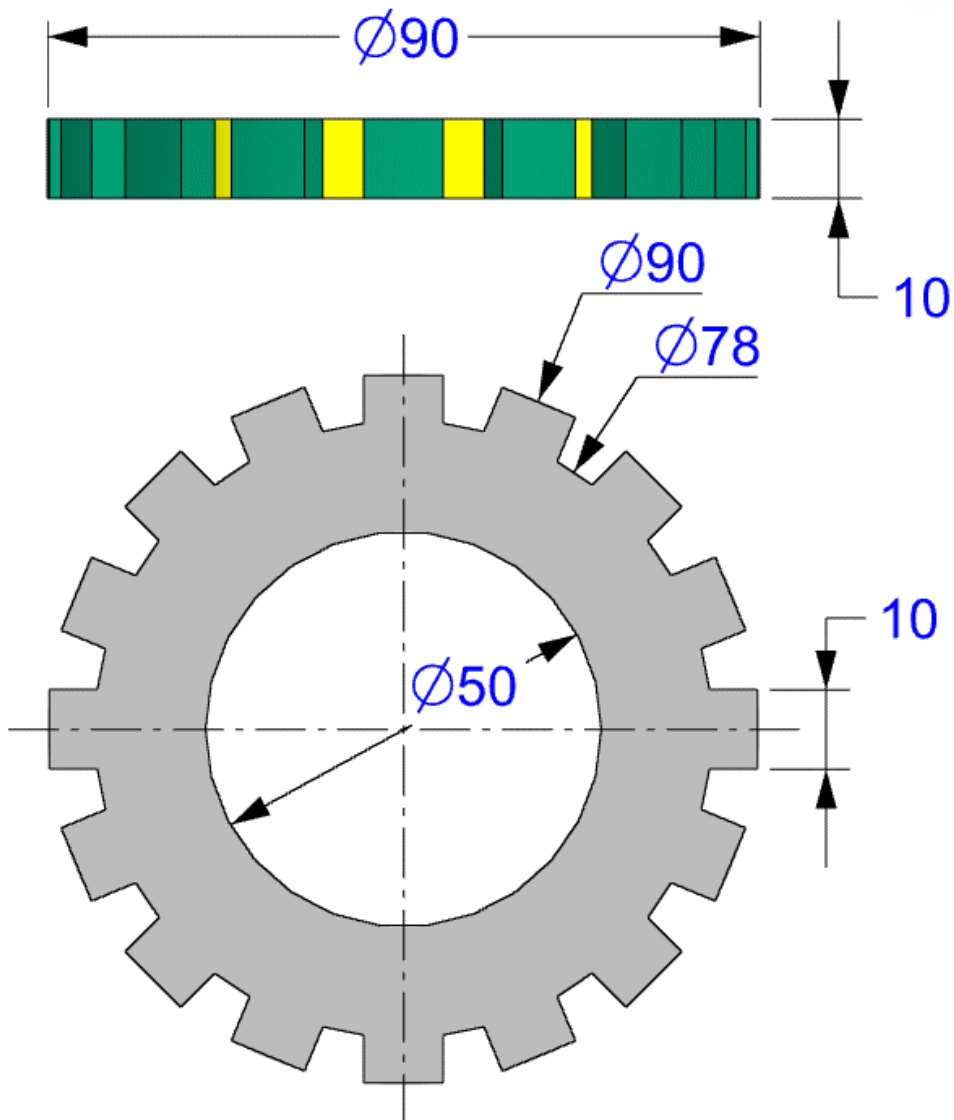
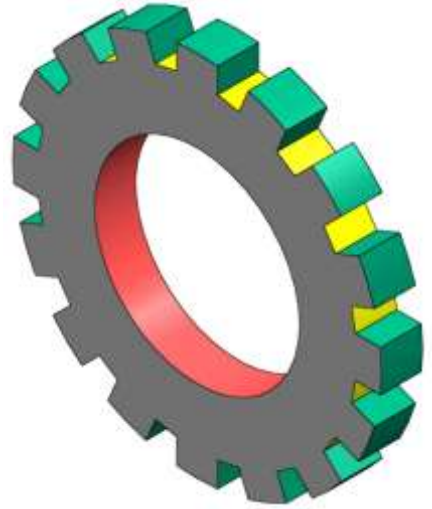
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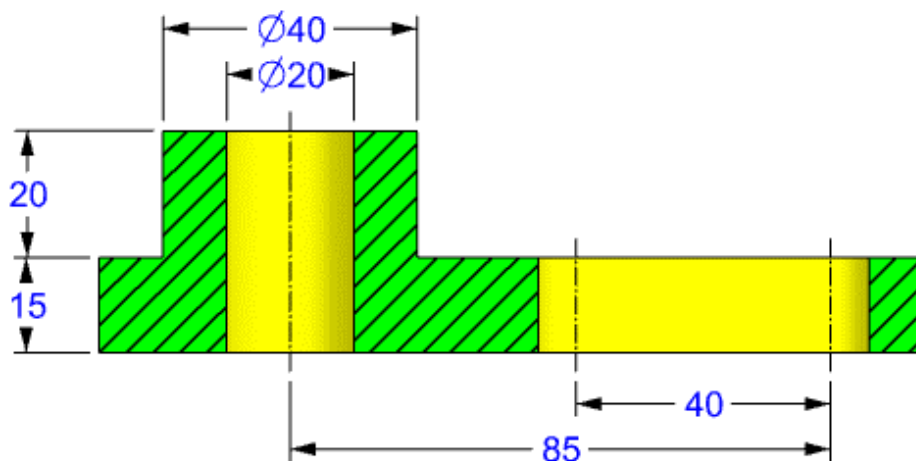
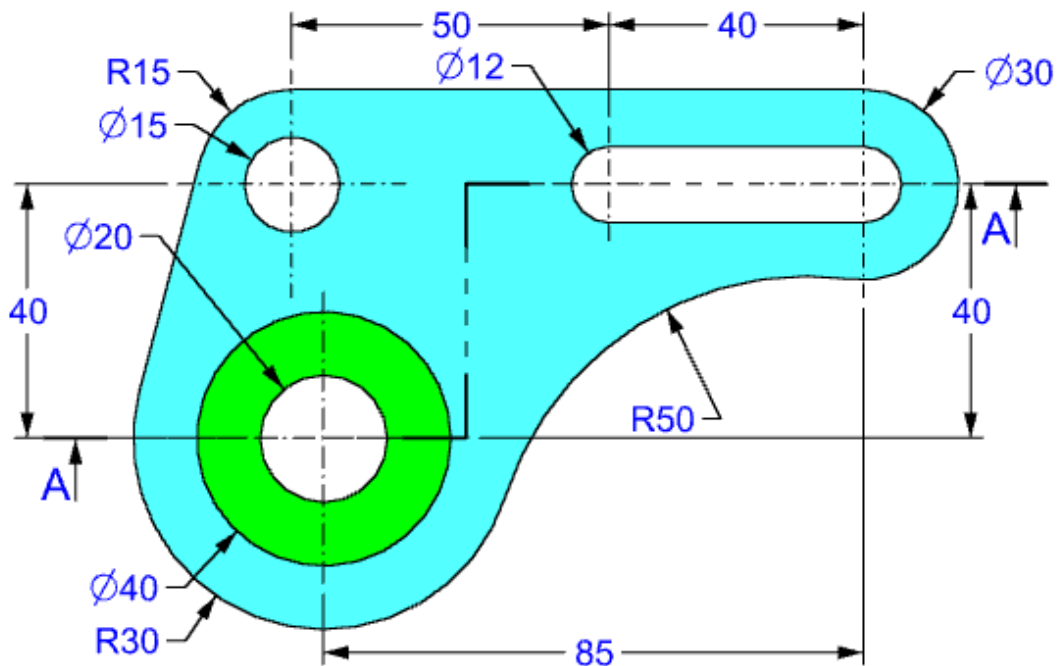
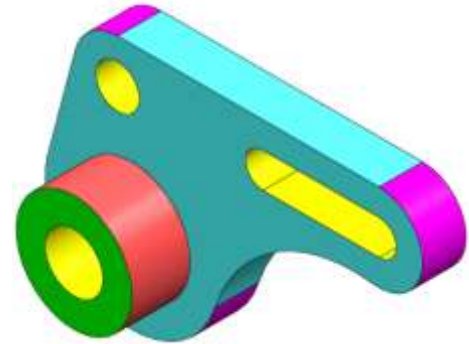
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SECTION A-A  
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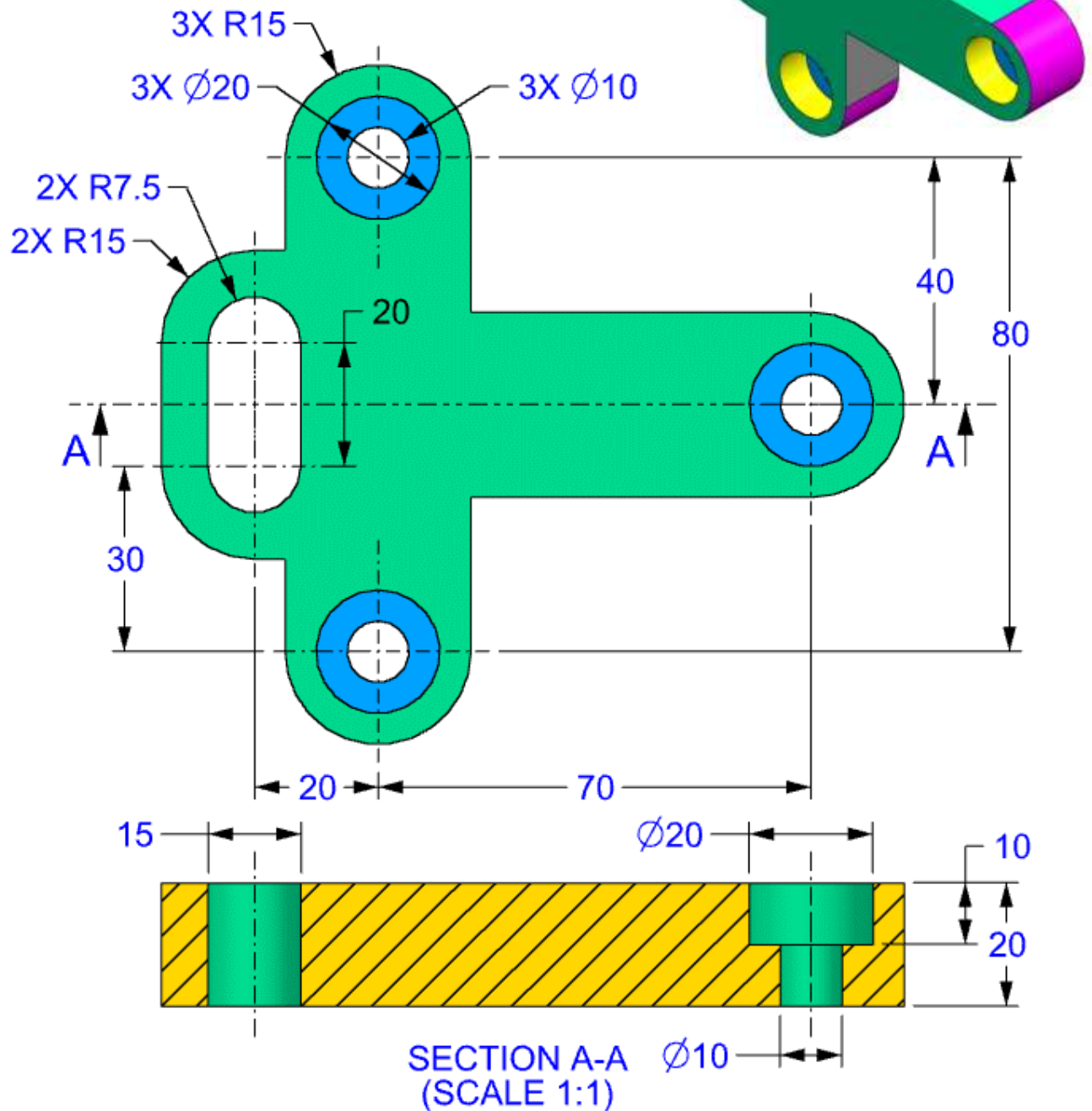
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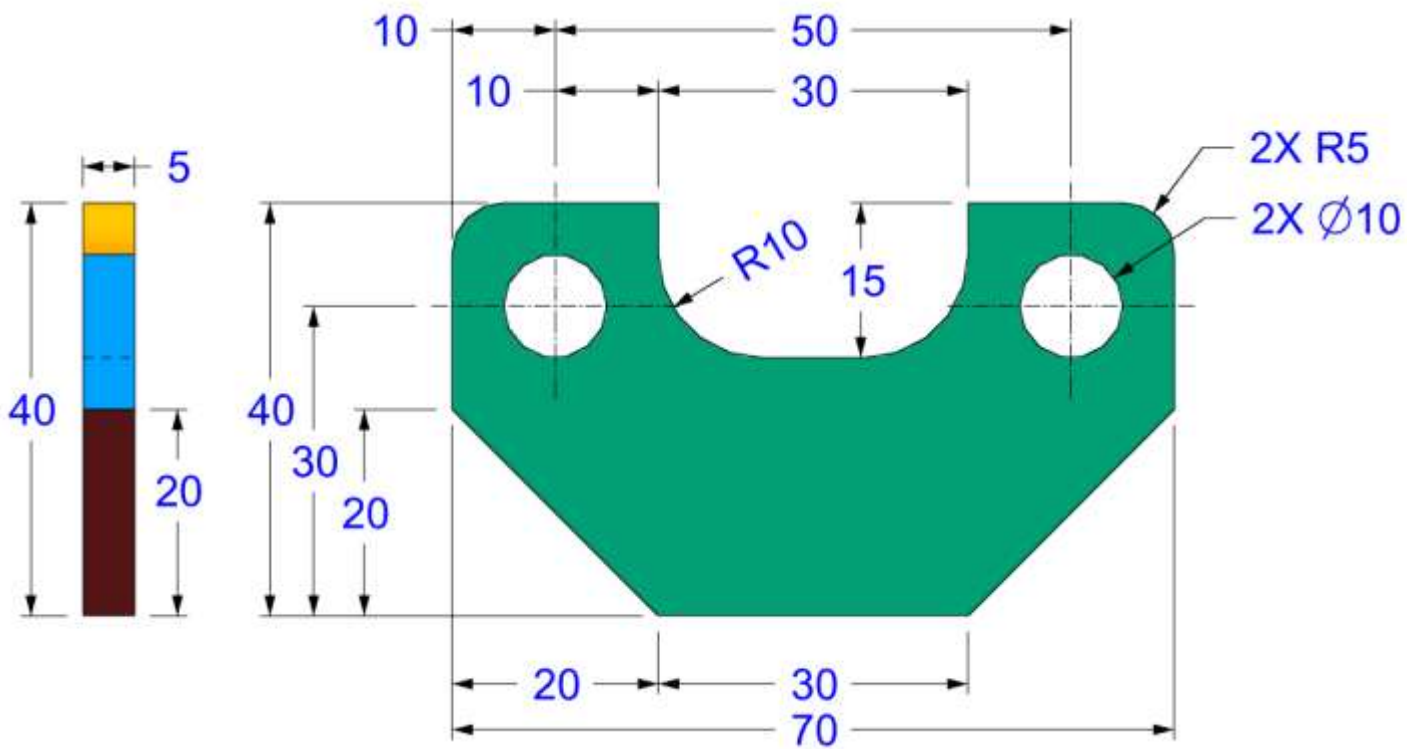
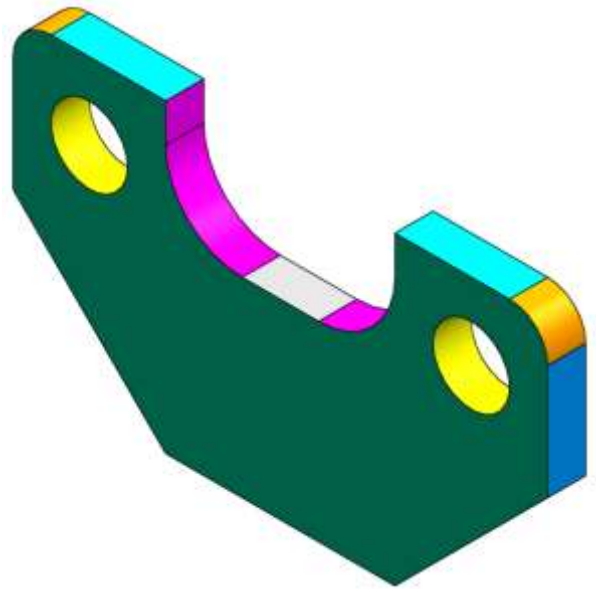
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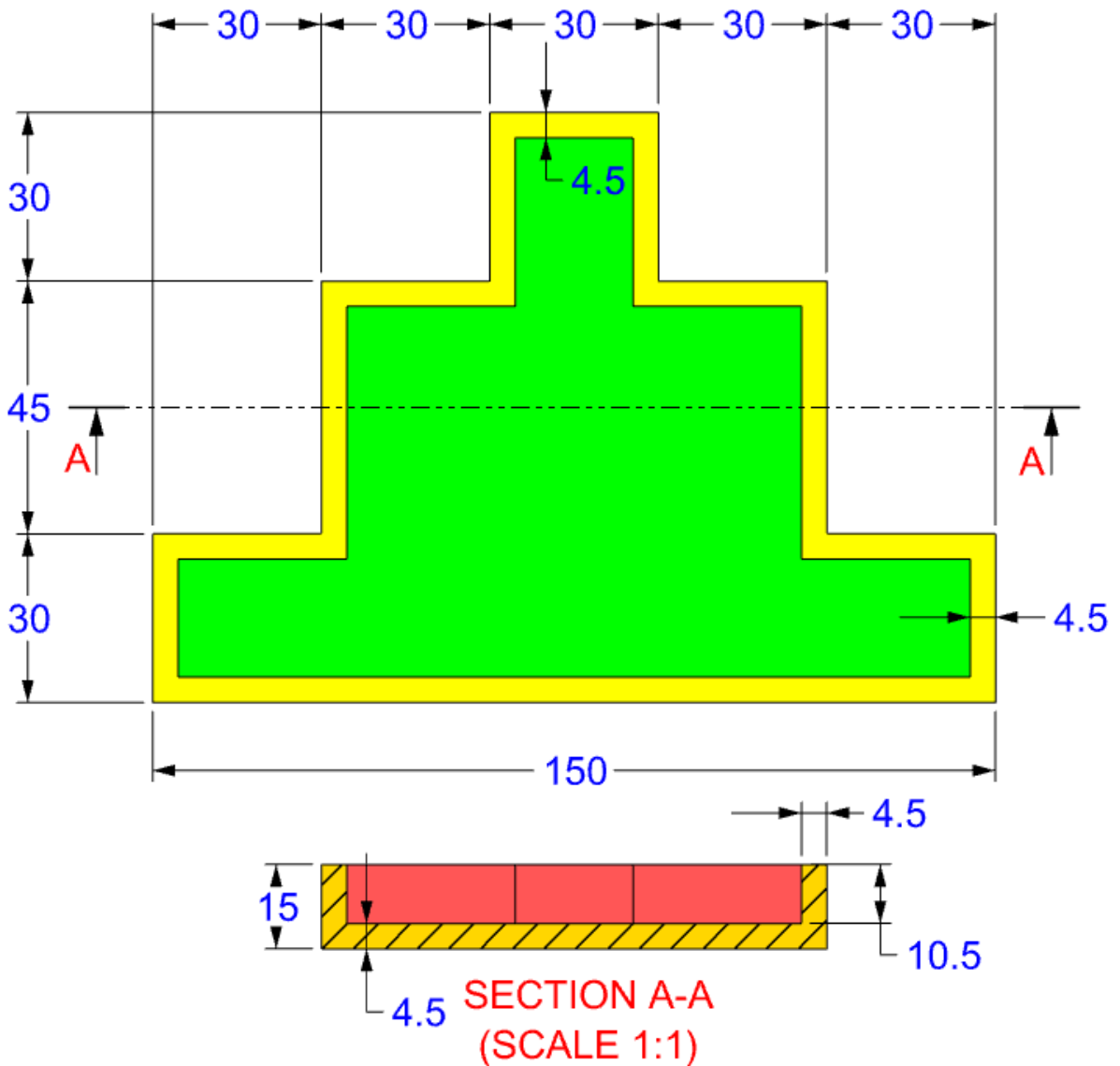
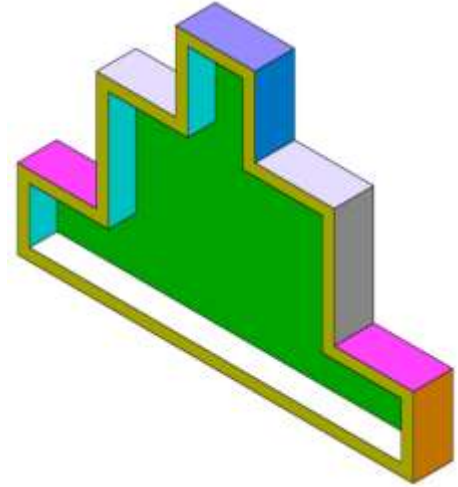
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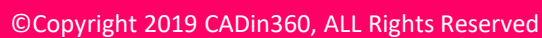
SECTION A-A  
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**EXERCISE-11**



**EXERCISE-13**

**EXERCISE-14**

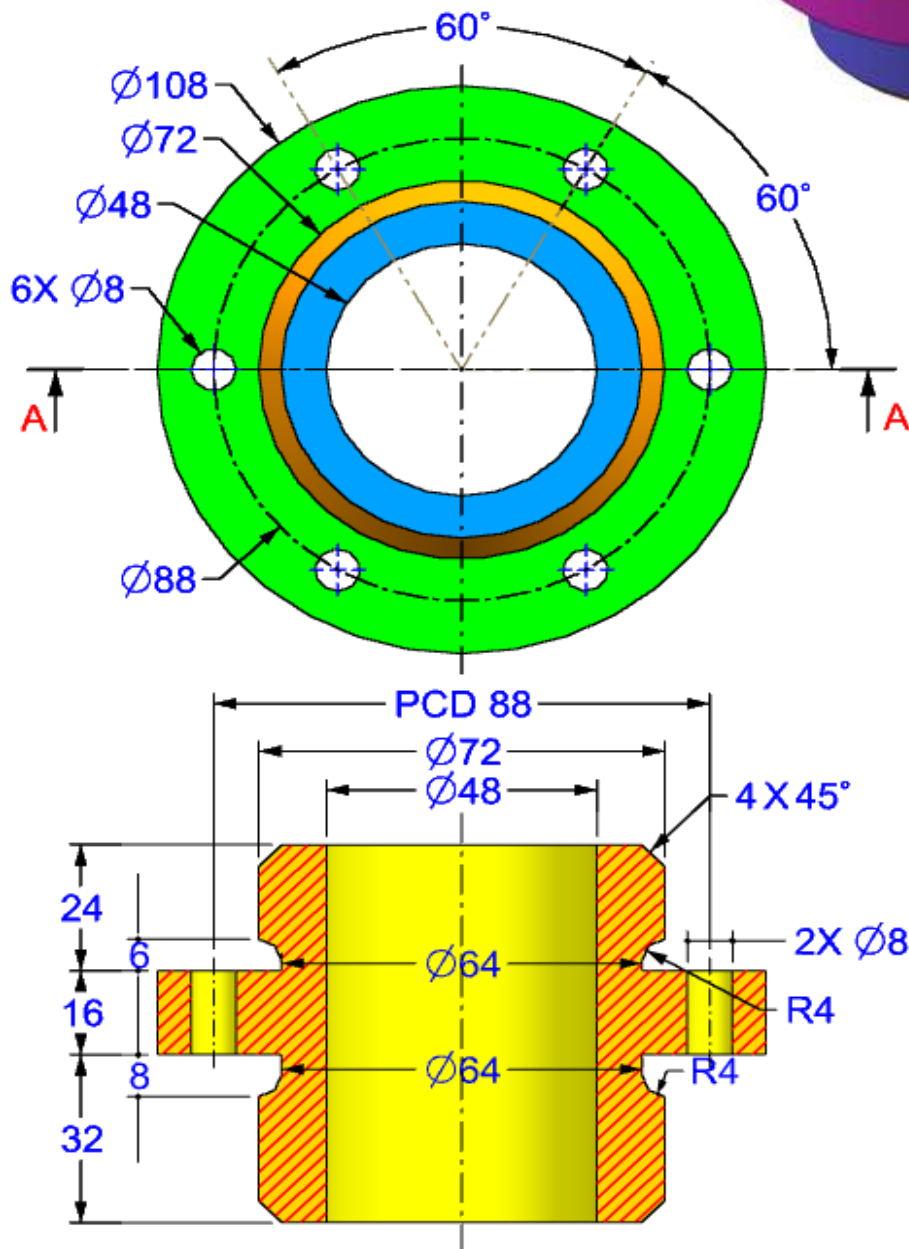






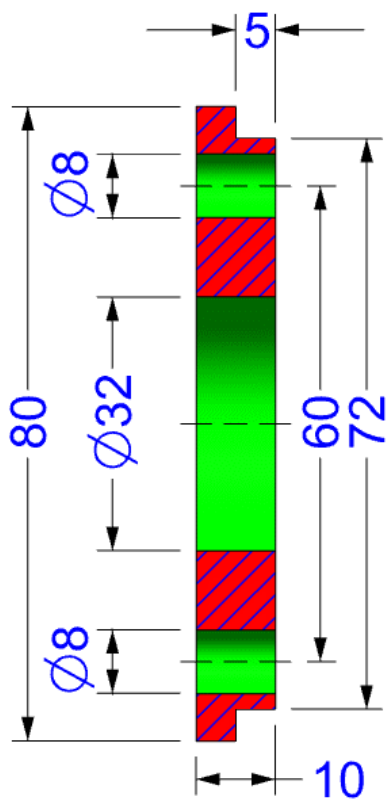
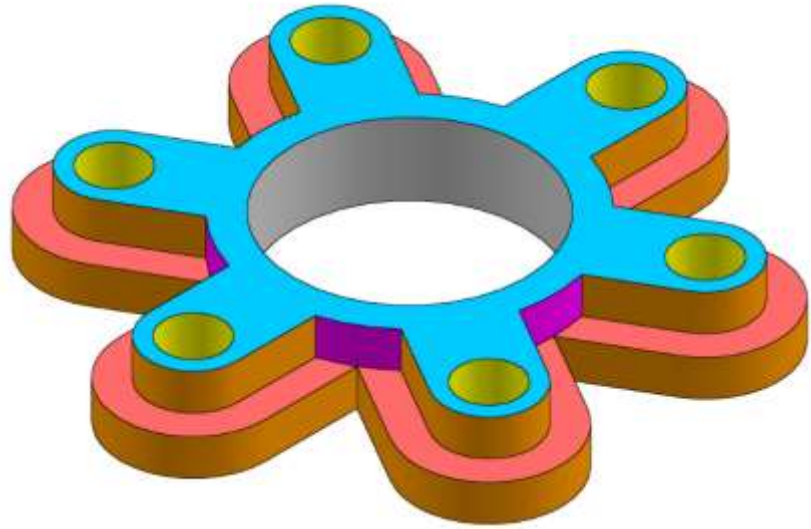


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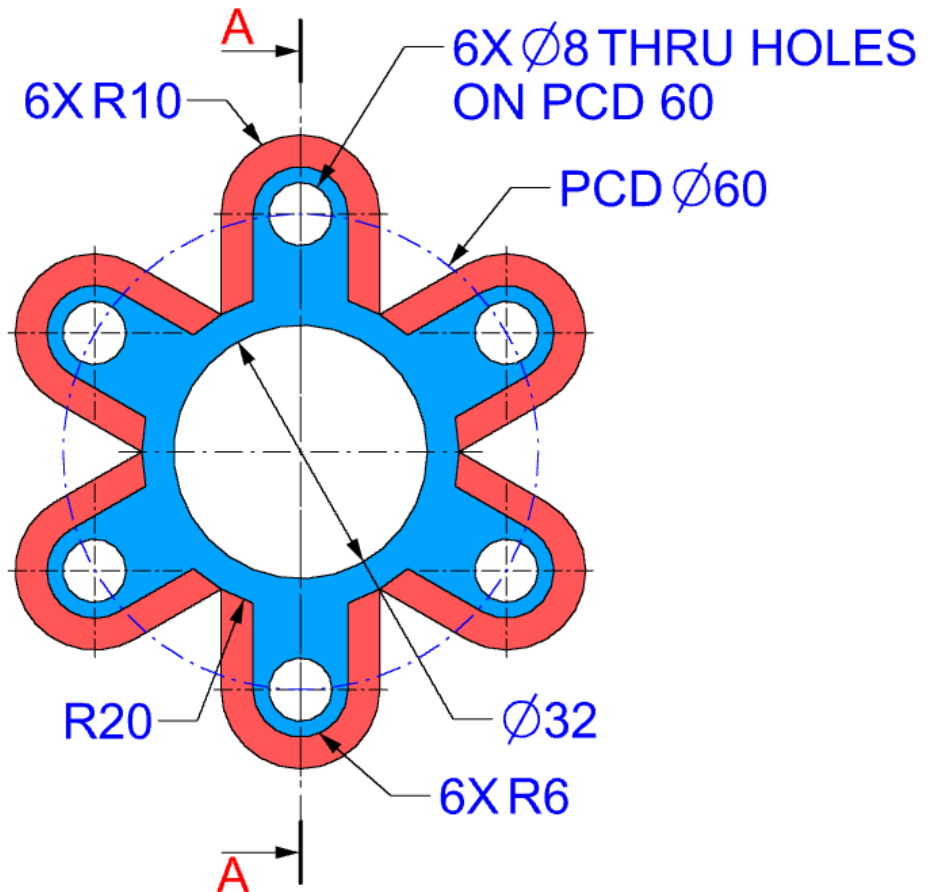


(SCALE 1:1) SECTION A-A

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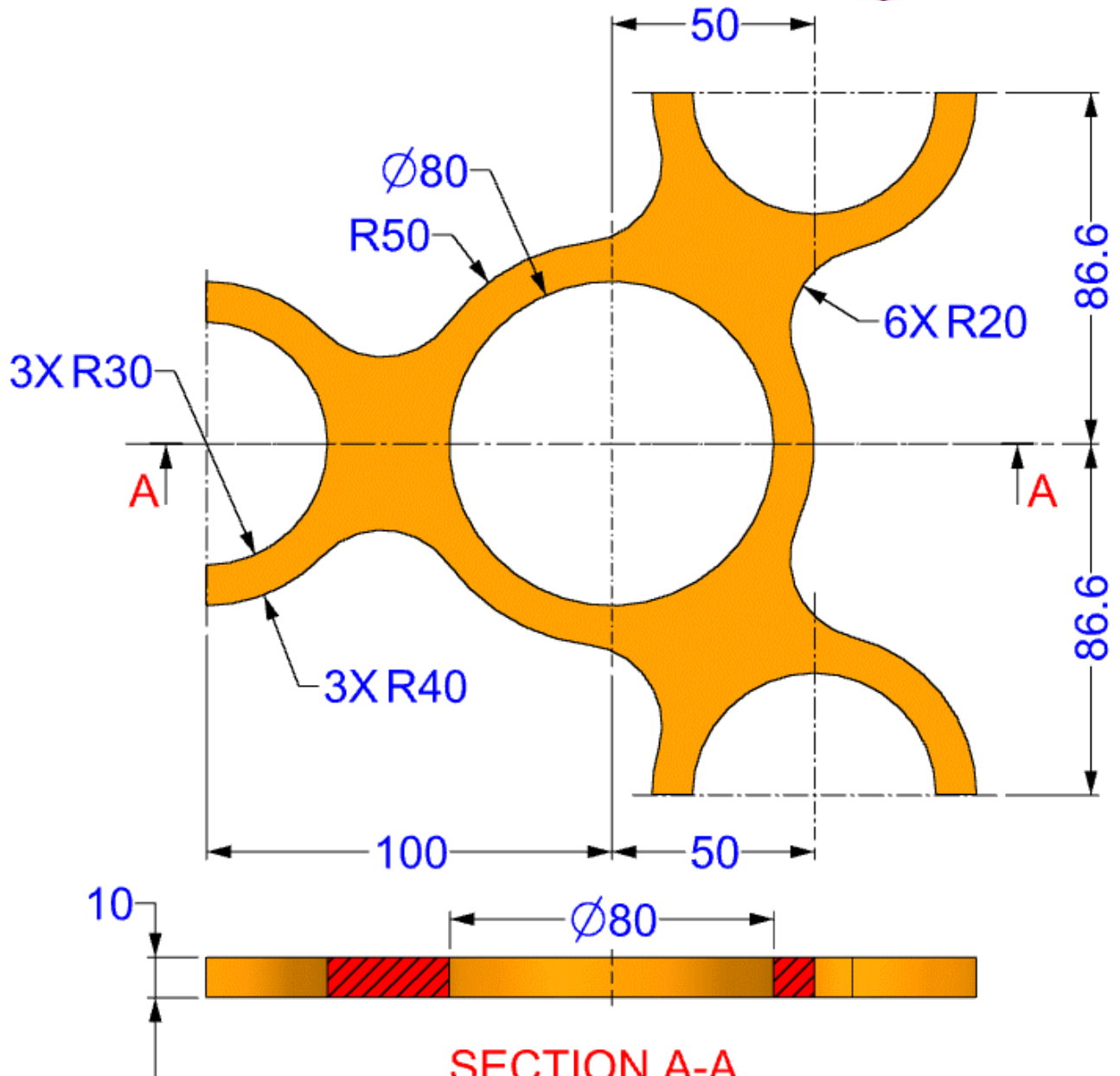
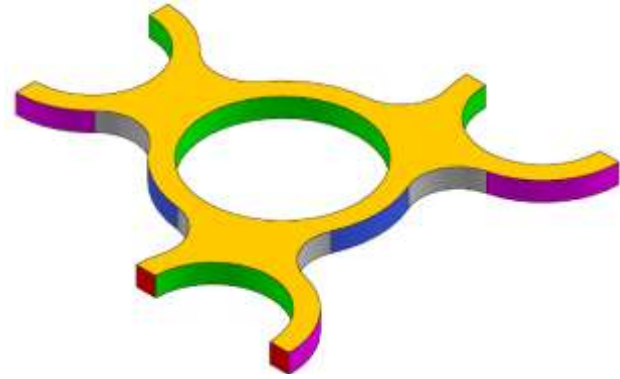


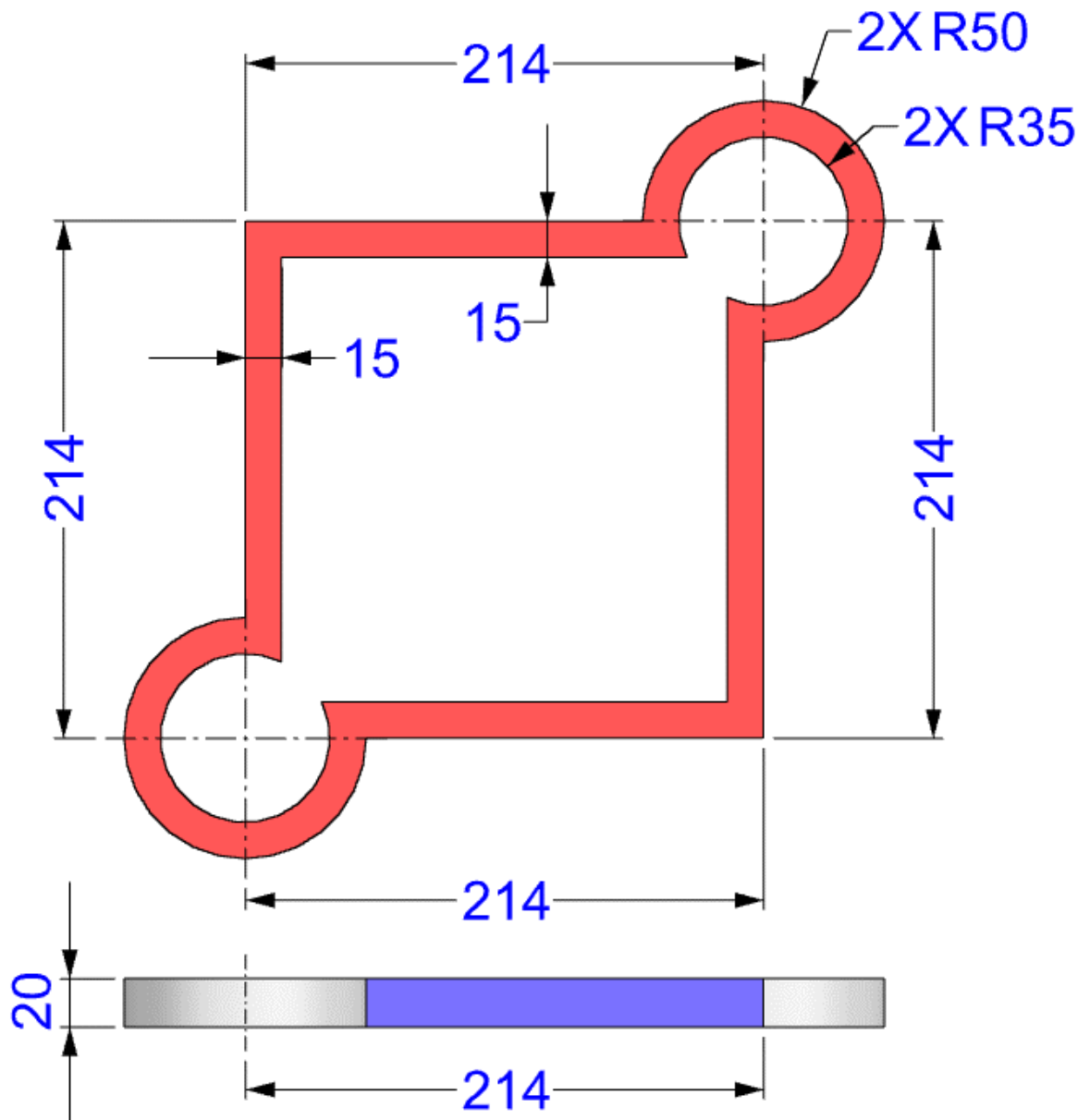
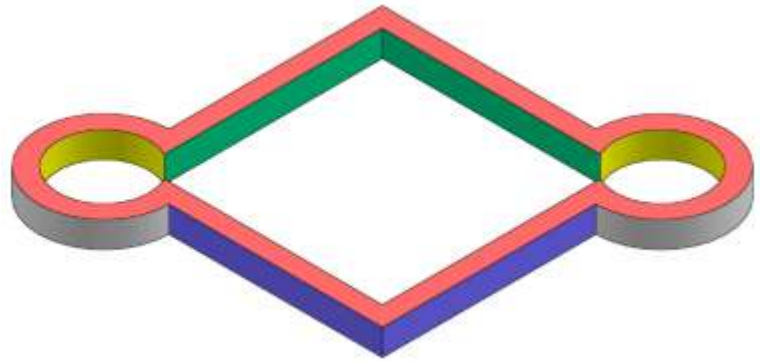
SECTION A-A



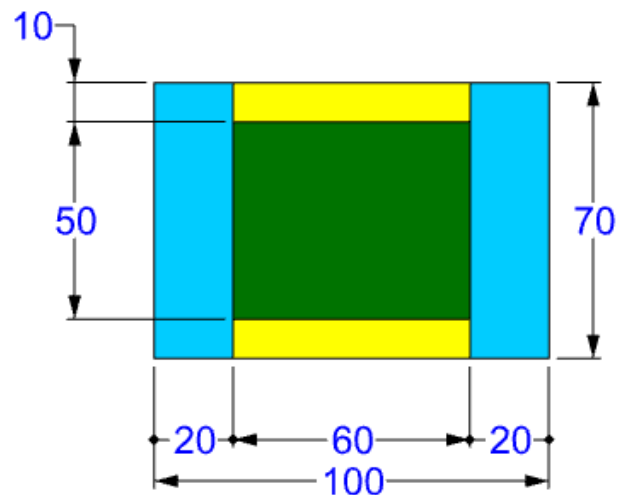
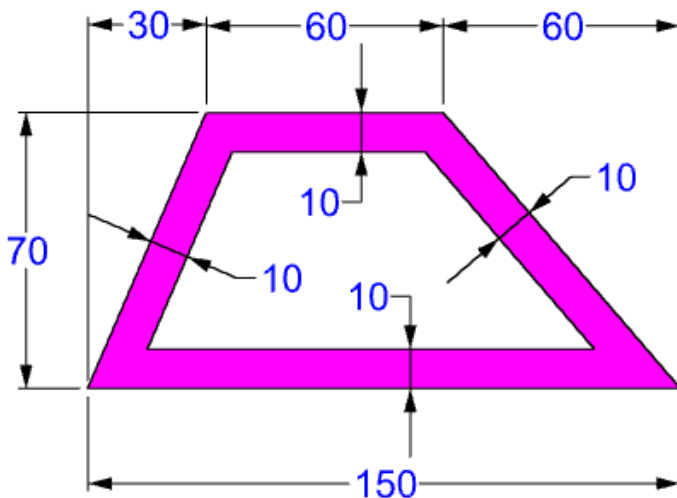
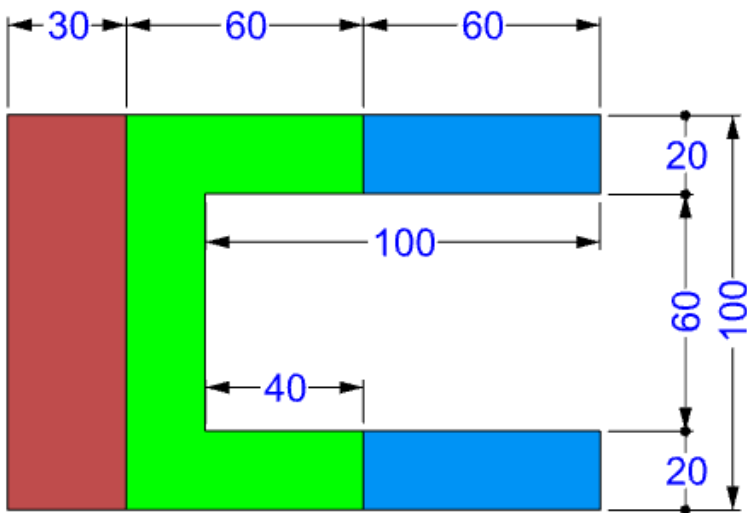
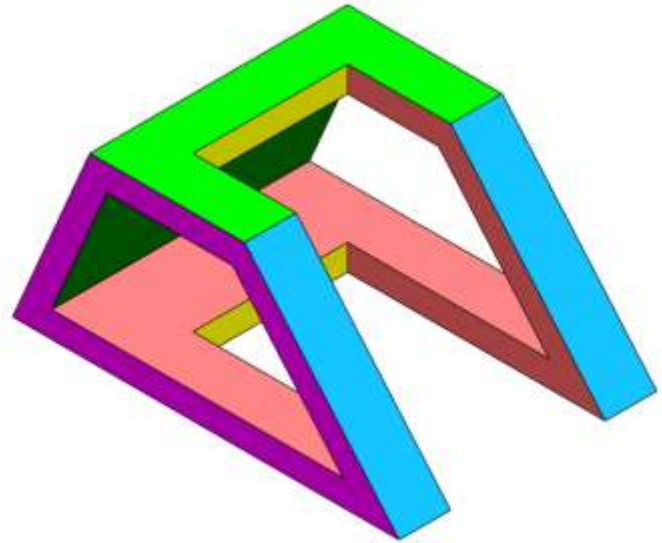


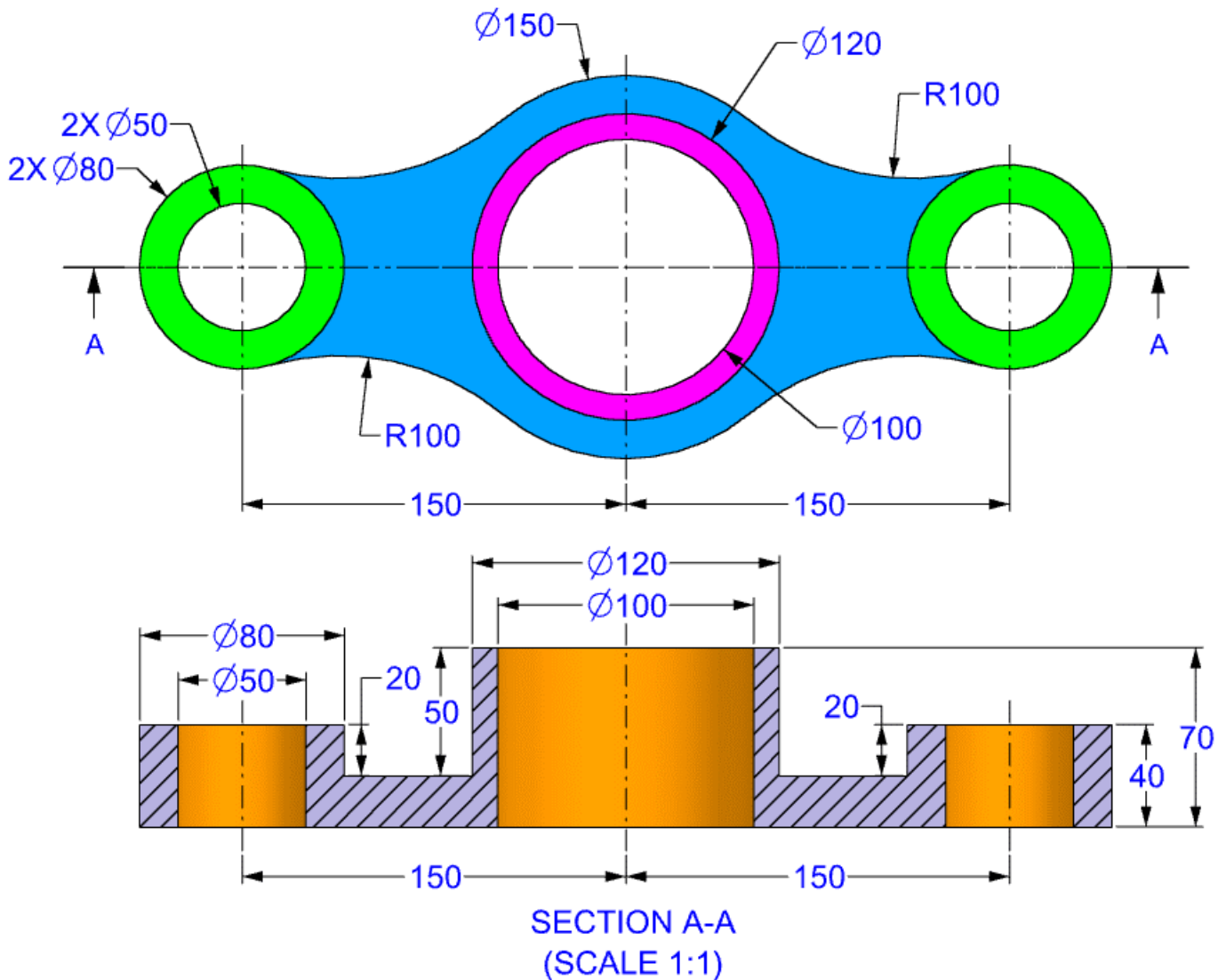
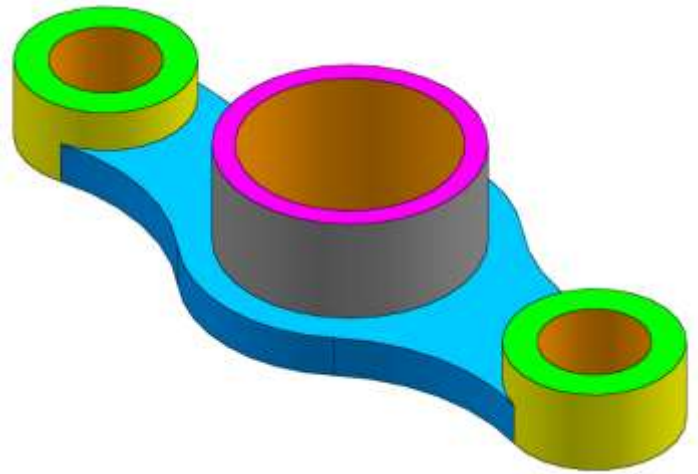


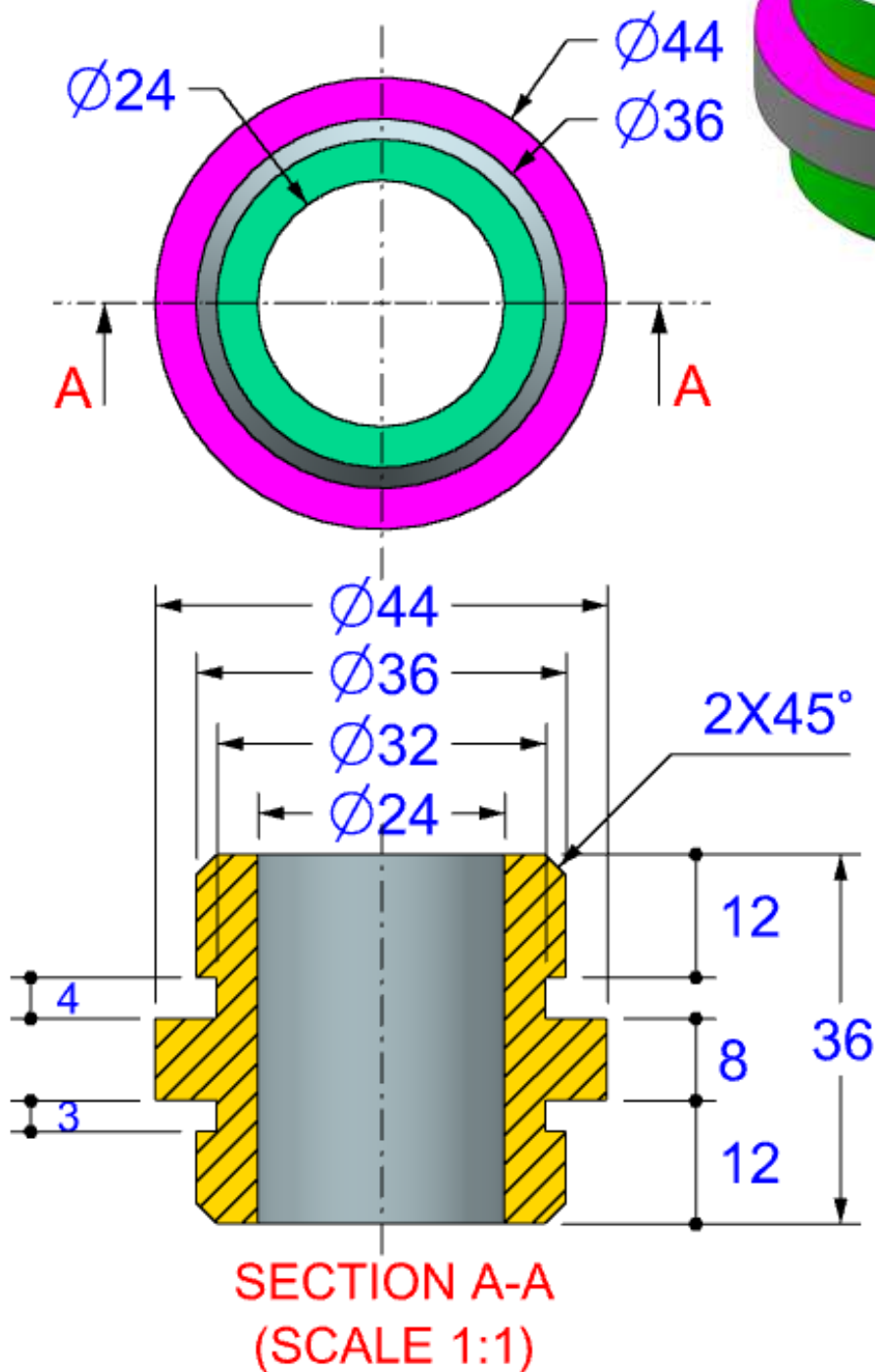
**EXERCISE-22**

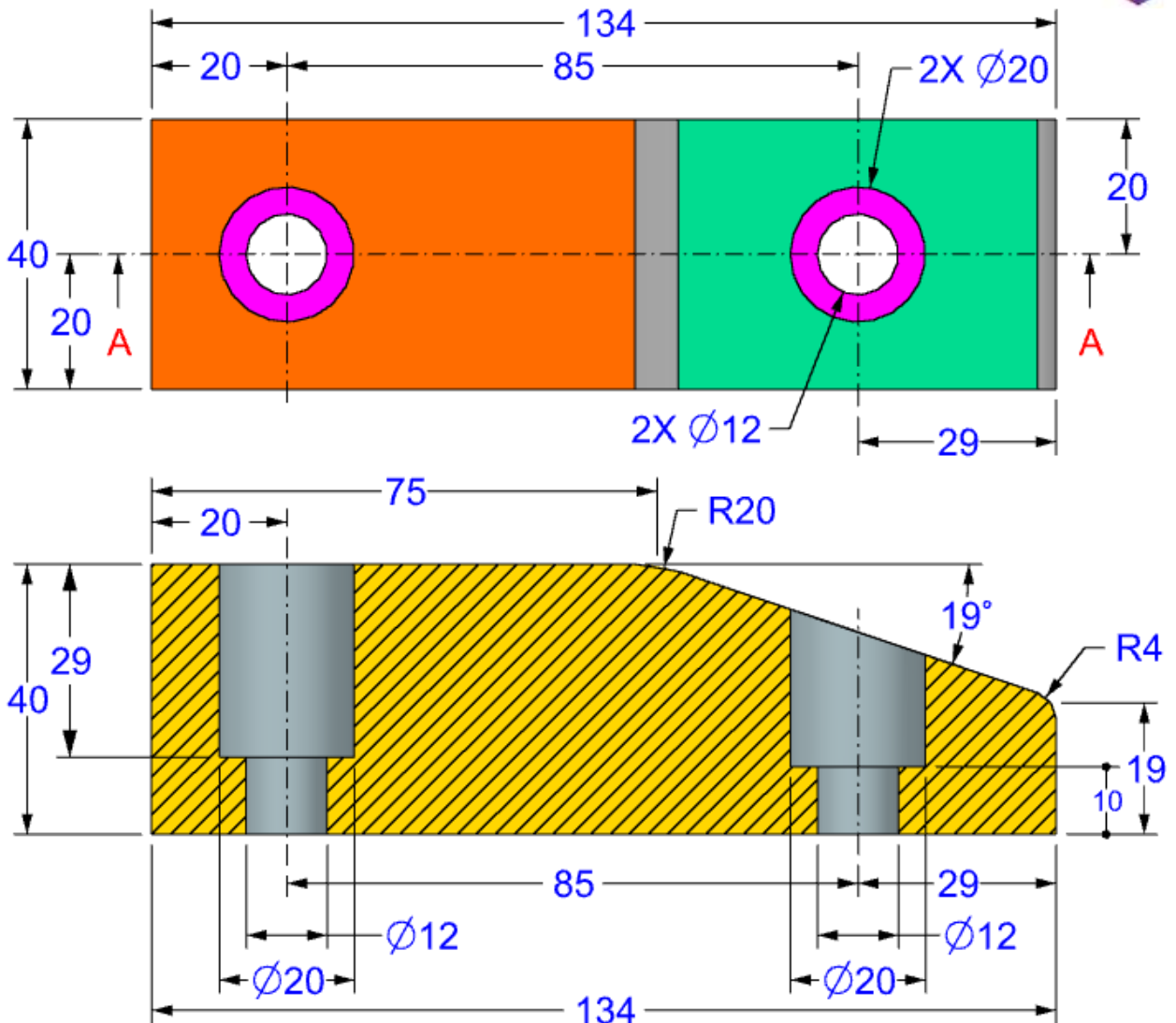
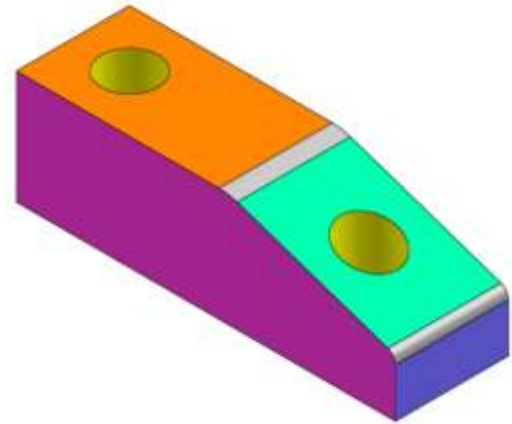
**EXERCISE-23**



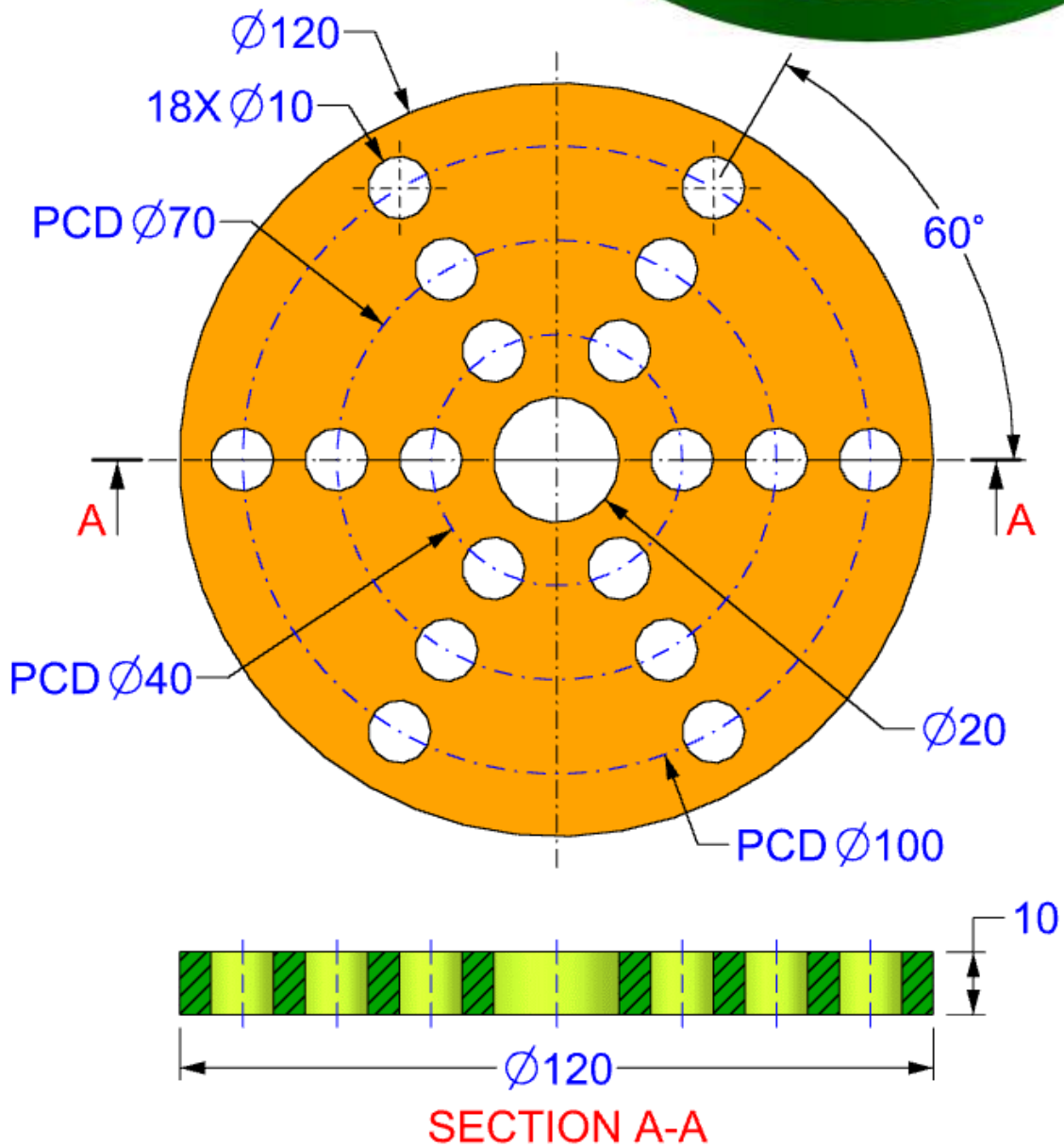
**EXERCISE-24**

**EXERCISE-25**

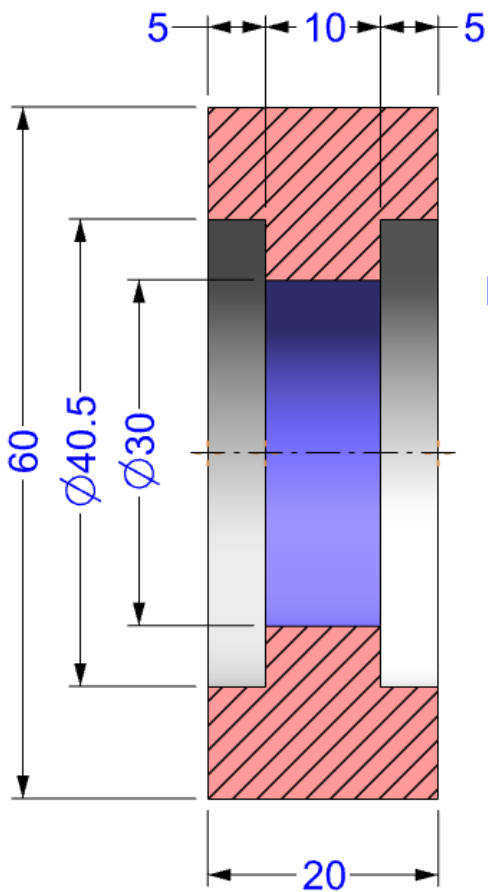
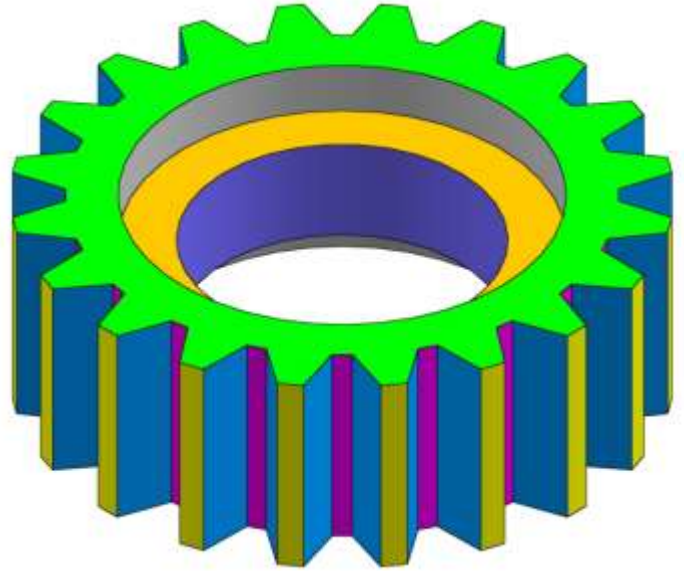
**EXERCISE-26**

**EXERCISE-27**

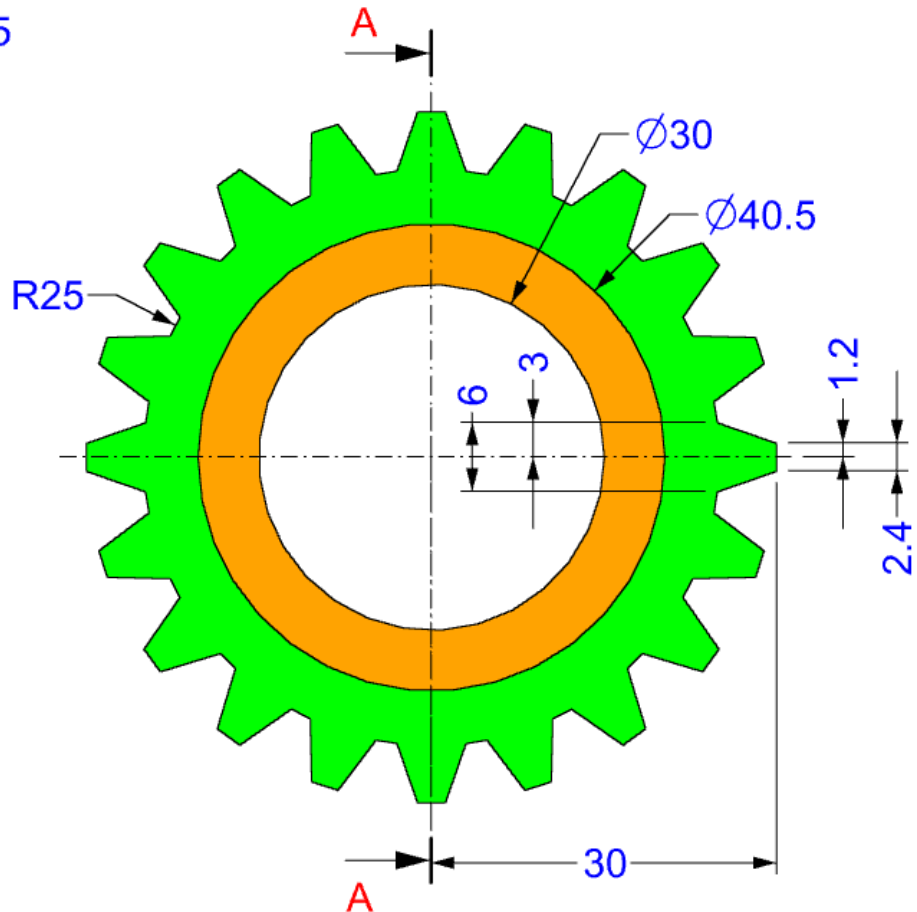
**SECTION A-A**  
**(SCALE 1:1)**

**EXERCISE-28**

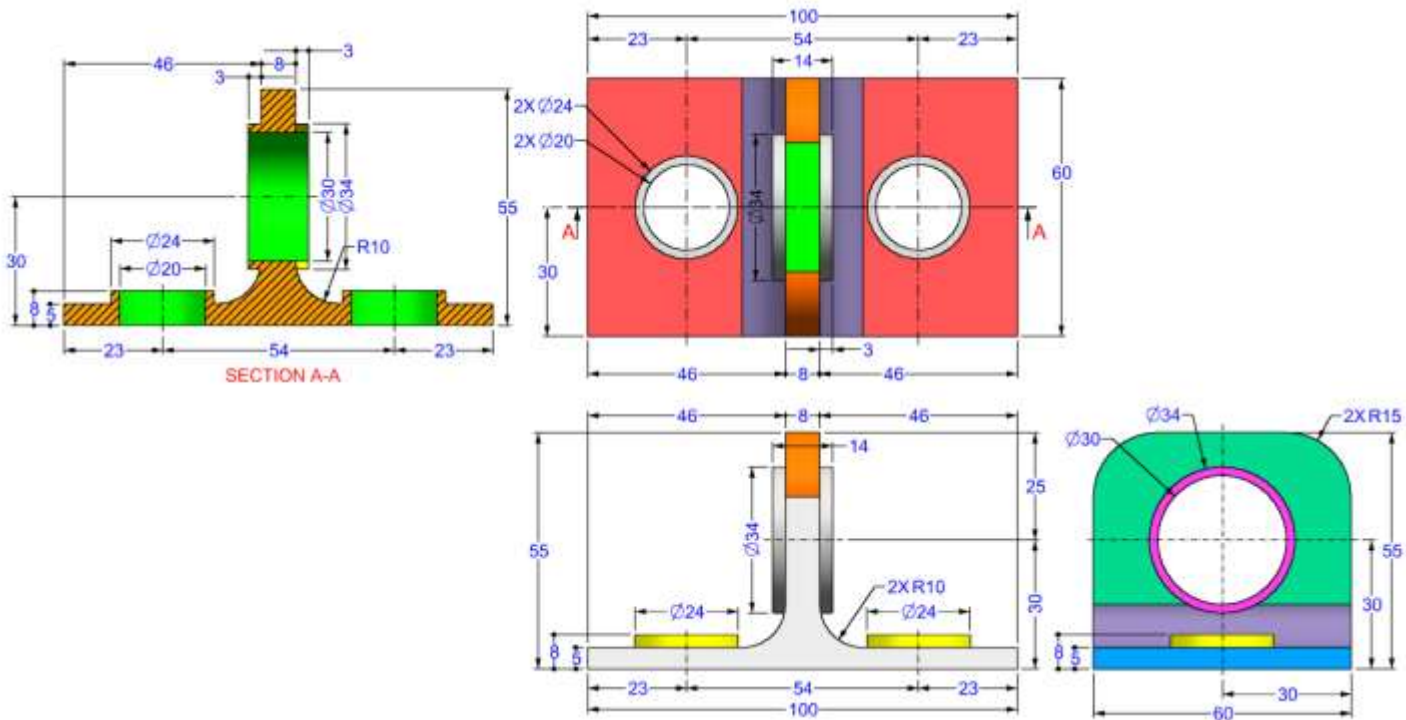
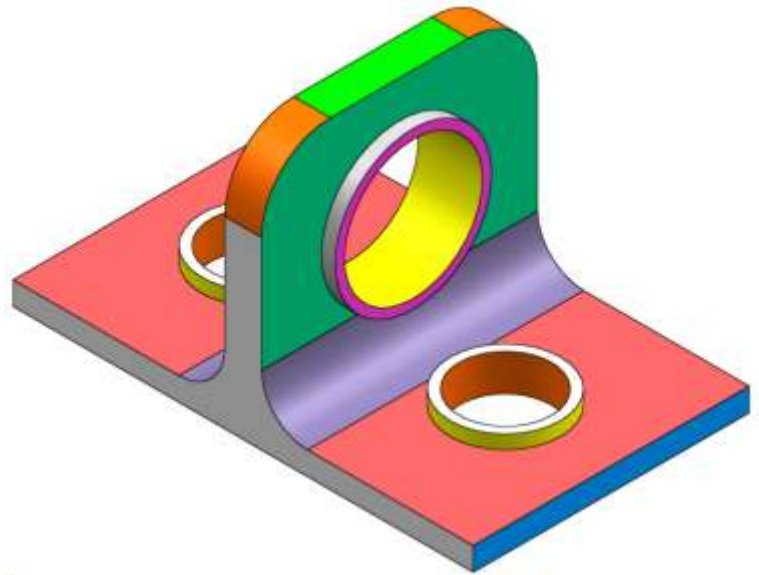
# EXERCISE-29



SECTION A-A

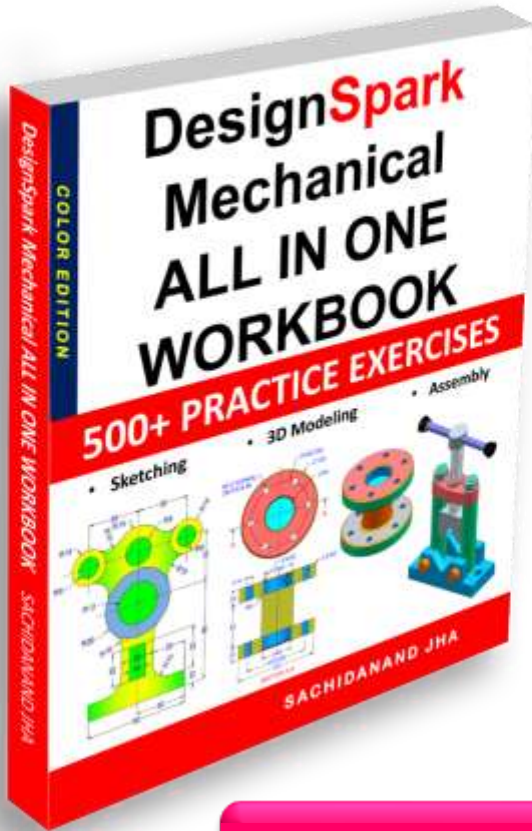


# EXERCISE-30





# END OF 3D SAMPLE



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# Transition to Assembly Modeling – Let's Start Assembly !

Great work completing the **3D Modeling** section!

You've practiced 3D modeling and understanding its dimensioning, and now it's time to elevate your skills by assembling 3D parts in Assembly environment.

This section features 150+ 3D part exercises to help you visualize and create solid 3D Assembly models.

## Why Practice 3D Assembly Drawings?

- Understand part relationships, constraints, joints, and motion.
- Learn how real-world products are designed using multiple parts.
- Improve your ability to read, interpret, and build from exploded or section views.
- Ideal for learners aiming for industry-level CAD proficiency.

Tip:

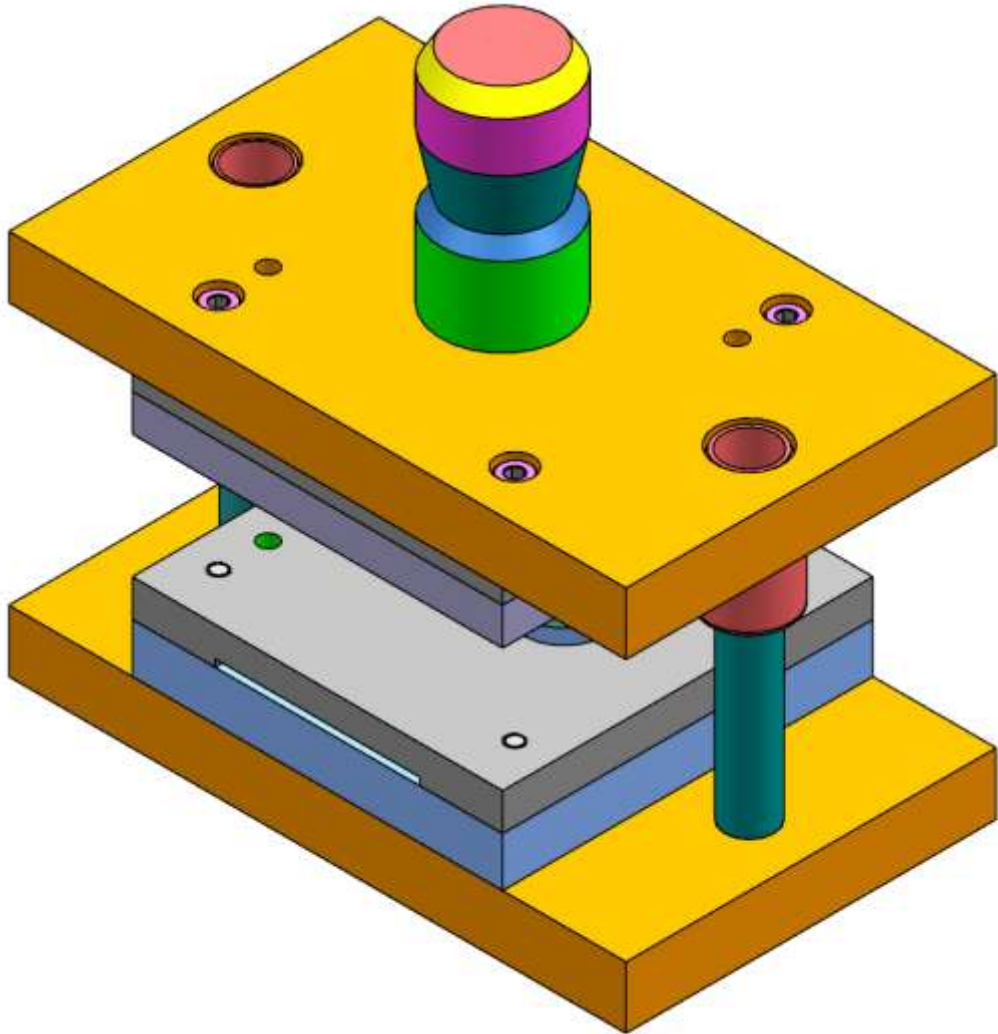
To get the best visual experience with shaded 3D shapes and colors, we recommend using the **Premium Color Edition** of this book.

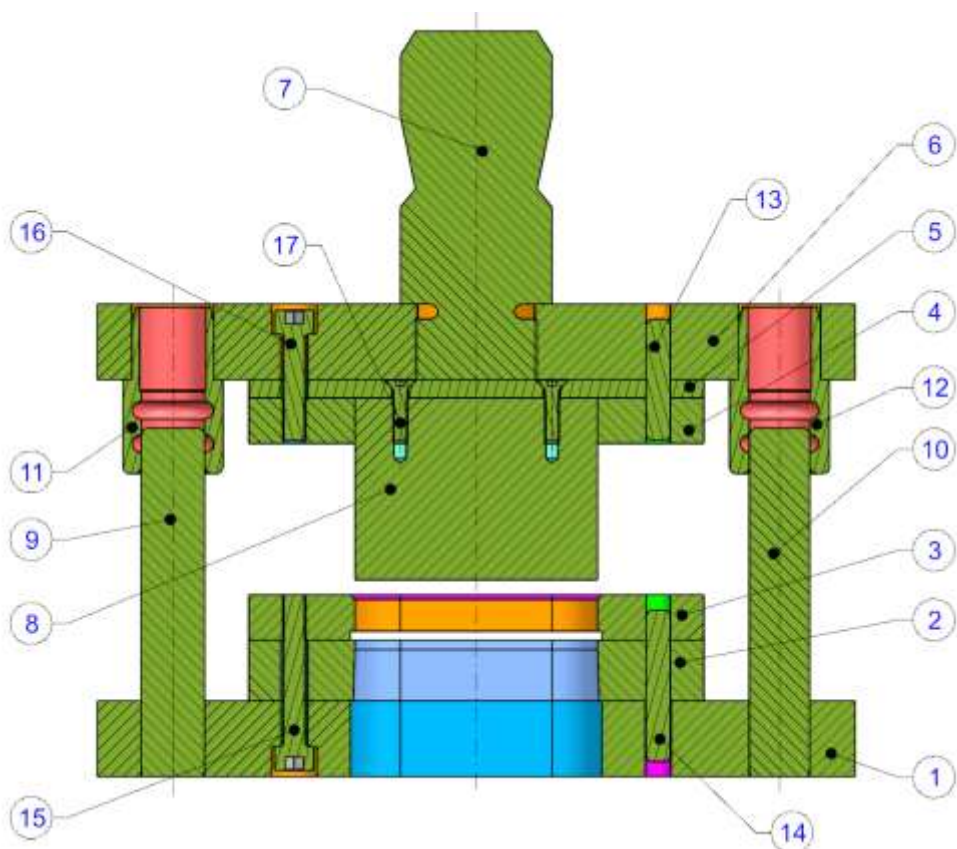
**Note:** Assembly models and its part files are available in STEP (.stp) format upon request.

Please email [cadin360@gmail.com](mailto:cadin360@gmail.com) with proof of purchase to receive the files.

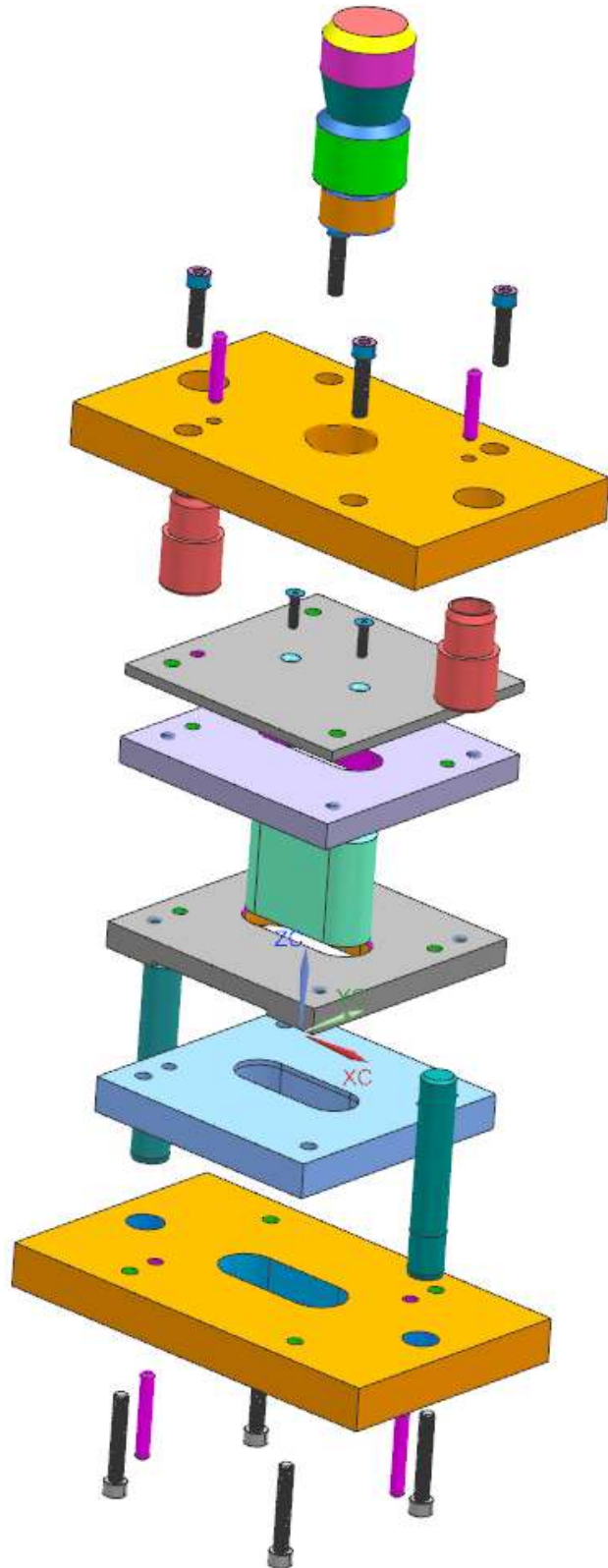
# ASSEMBLY

**Press Tool Assembly**





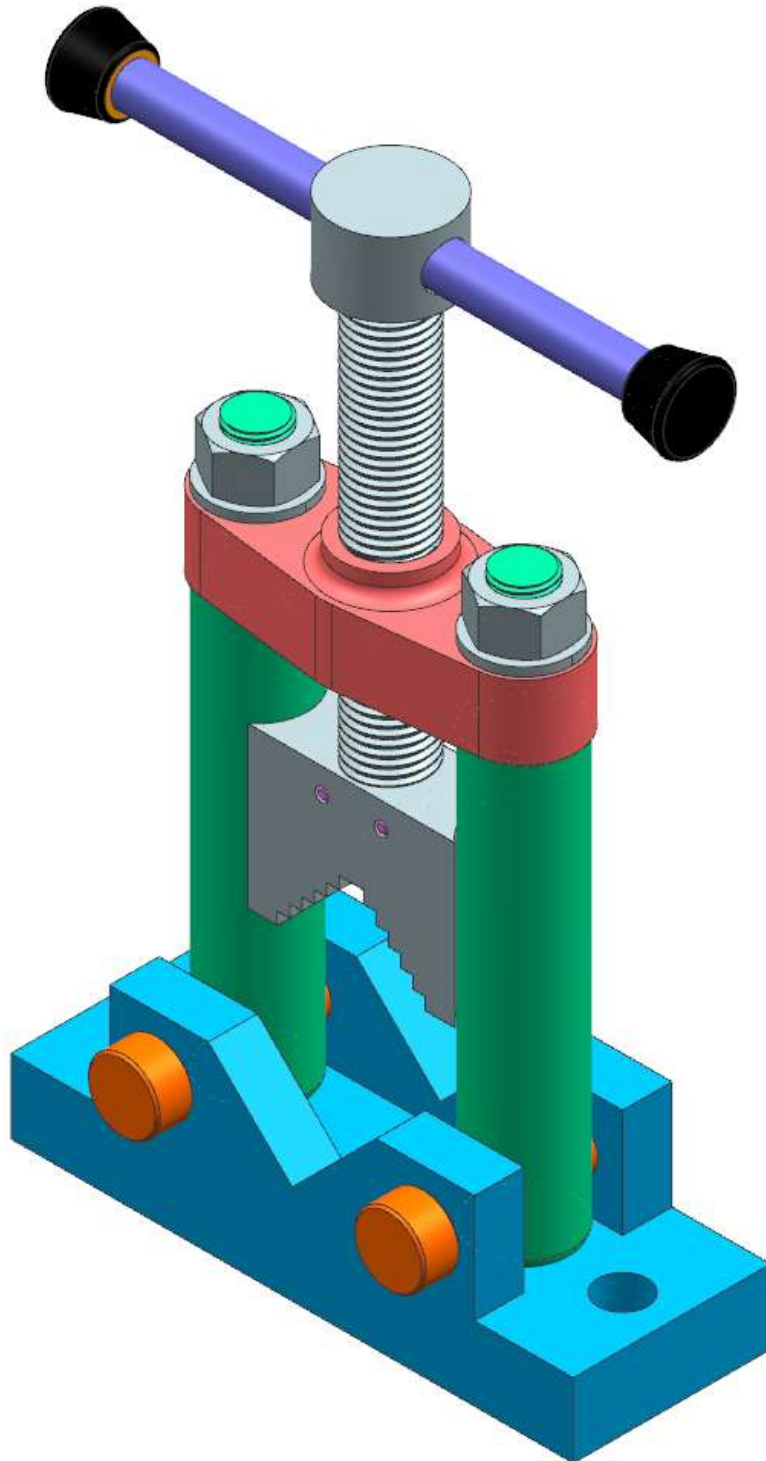
17	CSK M5X0.8X20MM	2
16	SHCS M8X1.25X35MM	4
15	SHCS M8X1.25X50MM	4
14	DOWEL DIA 8 X 50MM	2
13	DOWEL DIA 8 X 40MM	2
12	GUIDE BUSH DIA 20	1
11	GUIDE BUSH DIA 21	1
10	GUIDE PILLAR DIA 20	1
9	GUIDE PILLAR DIA 21	1
8	PUNCH	1
7	SHANK	1
6	TOP PLATE	1
5	THRUST PLATE	1
4	PUNCH HOLDER	1
3	STRIPPER PLATE	1
2	DIE PLATE	1
1	BOTTOM PLATE	1
ITEM NO.	PART NAME	QTY



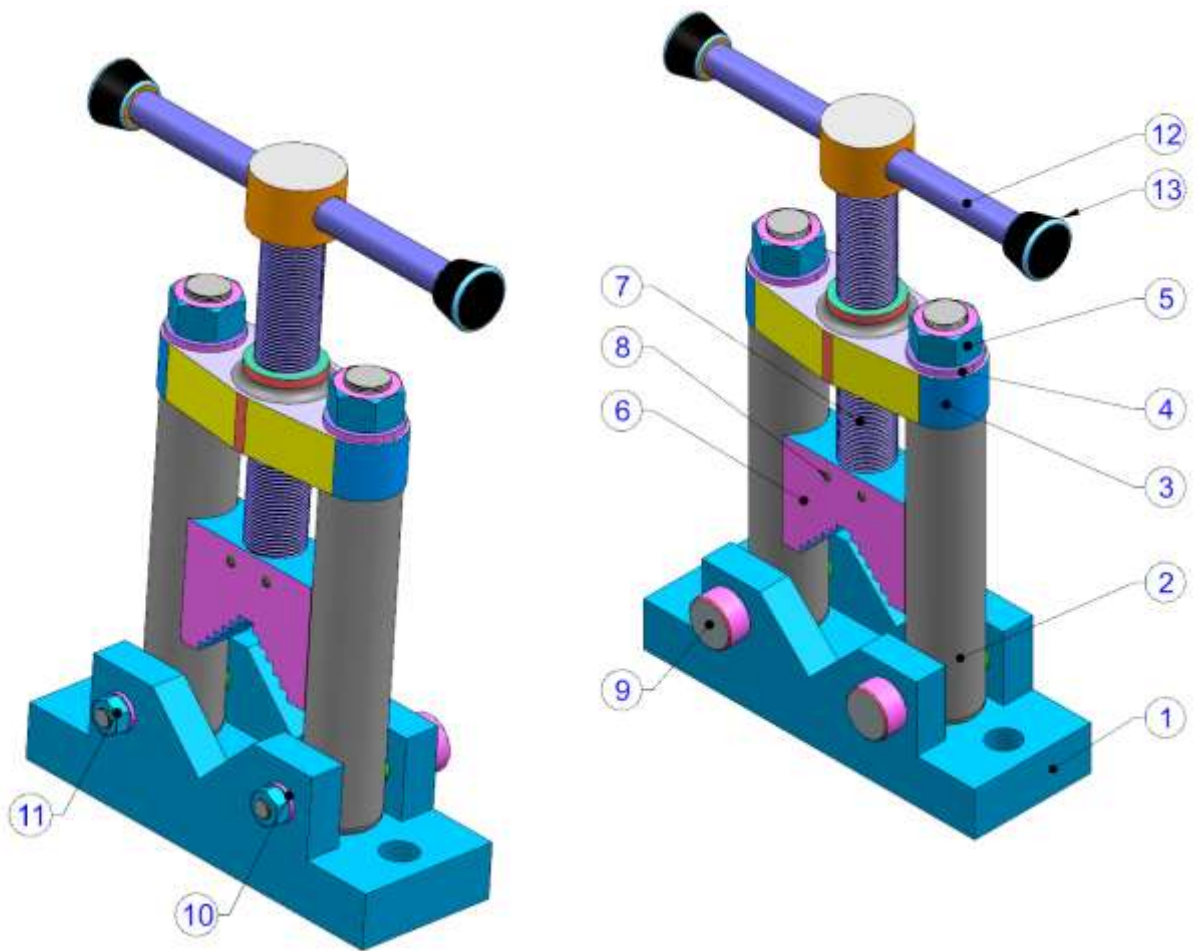
**Exploded View**

## ASSEMBLY EX-02

### Pipe Vice Assembly



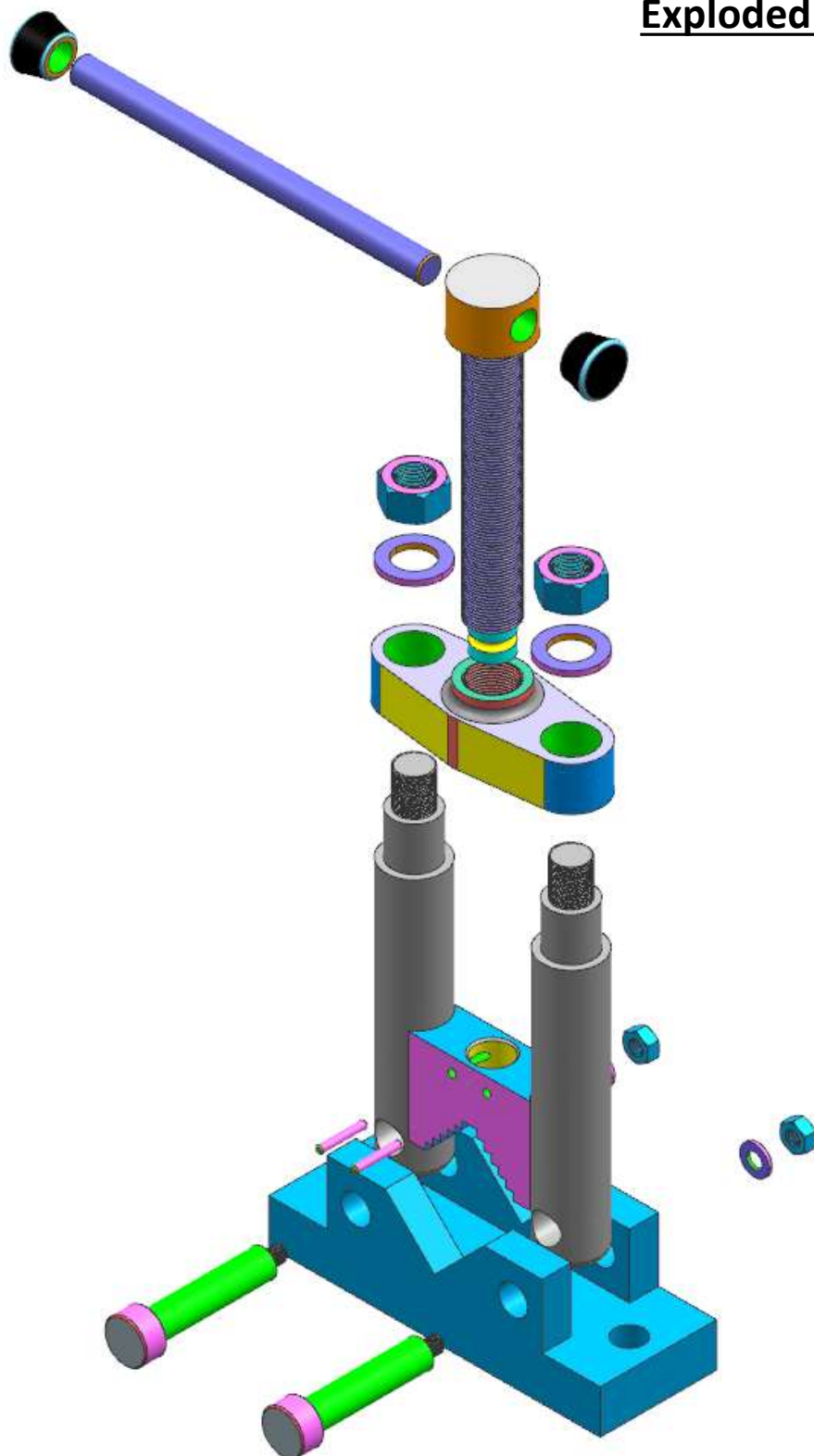




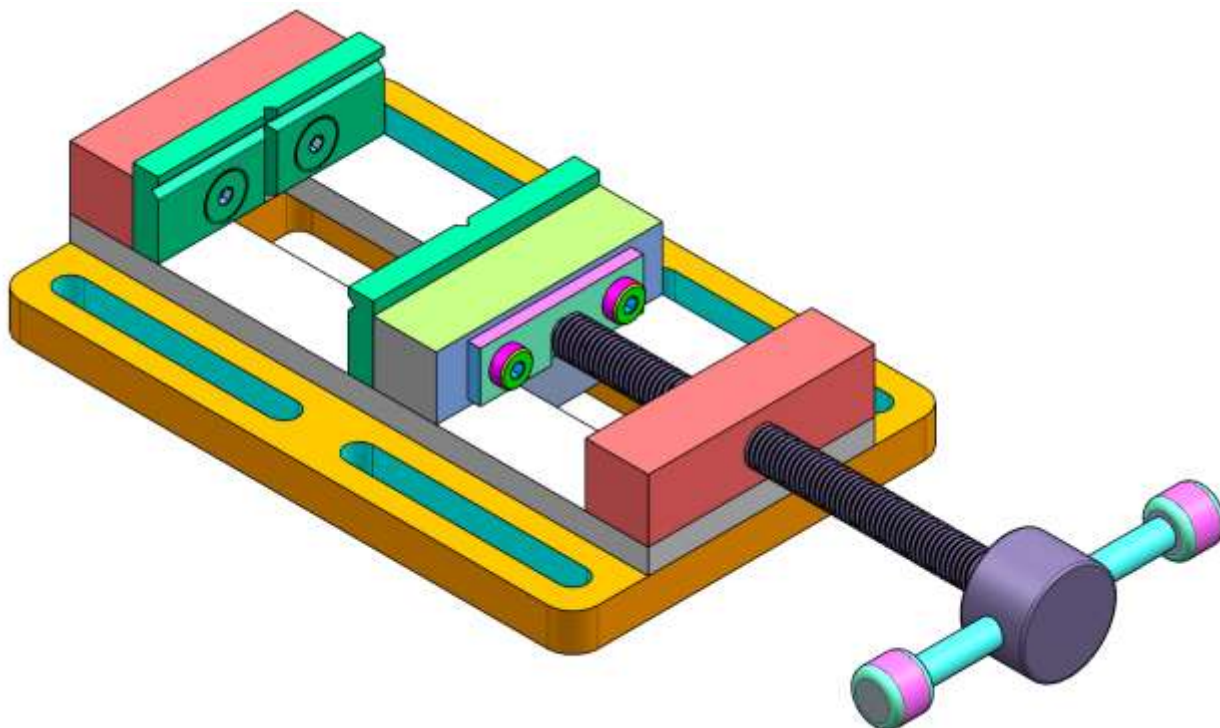
13	HANDLE CAP	2
12	HANDLE	1
11	M10 X 1.5 HEX NUT	2
10	M10 WASHER	2
9	HOLDING PIN	2
8	SUPPORT PIN	2
7	SPINDLE	1
6	MOVING JAW	1
5	M22 X 1.5 HEX NUT	2
4	M22 WASHER	2
3	CONNECTING WAGES	1
2	MOUNTING SHAFT	2
1	FIXED JAW	1
ITEM NO.	PART NAME	QTY

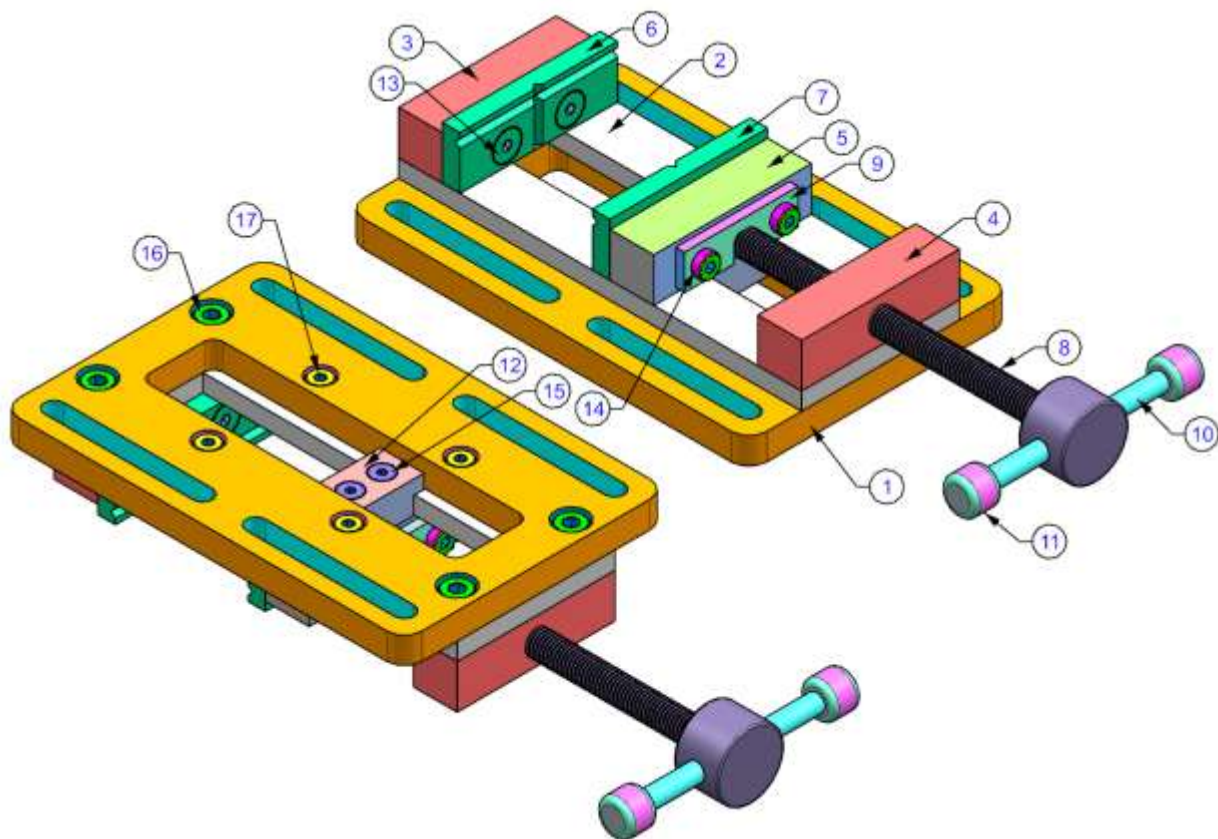


## Exploded View



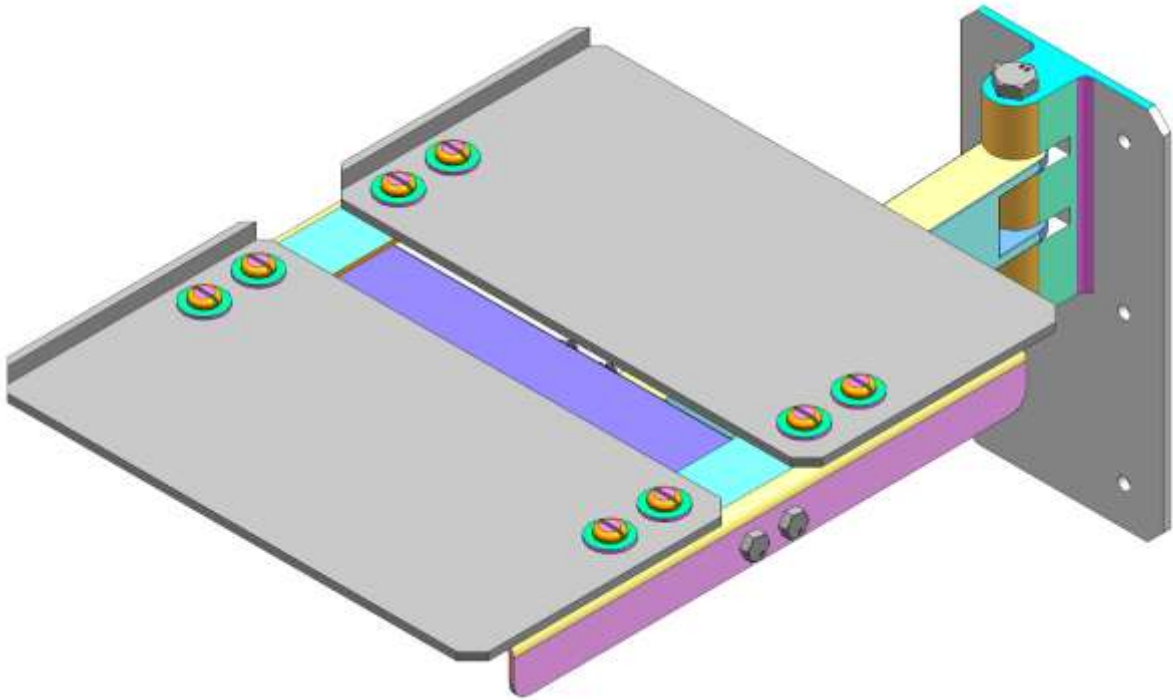
## **Machine Vice Assembly**

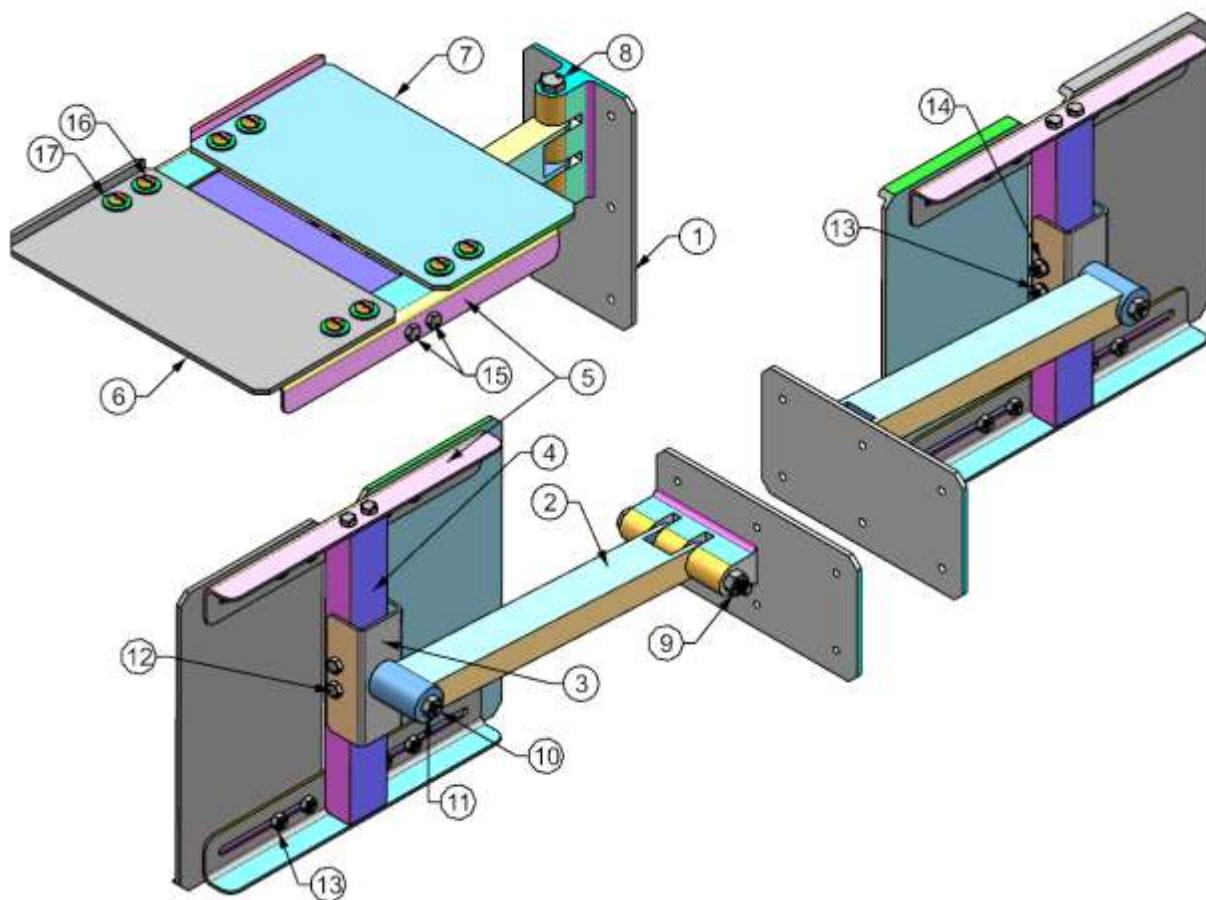




17	SOCKET HEAD CAP SCREW M8 X 1.25 X 14MM	4
16	SOCKET HEAD CAP SCREW M10 X 1.5 X 40MM	4
15	CSK SCREW M6 X 1 X 25MM	2
14	SOCKET HEAD CAP SCREW M8 X 1.25 X 20MM	2
13	CSK SCREW M8 X 1.25 X 25MM	4
12	MOVING JAW GUIDING PLATE	1
11	HANDLE CAP	2
10	HANDLE	1
9	THREADED ROD CLAMPING PLATE	1
8	THREADED ROD	1
7	CLAMPING JAW PLATE MOVING SIDE	1
6	CLAMPING JAW PLATE FIXED SIDE	1
5	MOVING JAW SOLID BAR	1
4	FIXED SOLID BAR MOVING END	1
3	FIXED JAW SOLID BAR	1
2	VICE TOP PLATE	1
1	VICE BOTTOM PLATE	1
ITEM NO	PART NAME	QTY

**Wall Mount Tv Stand**

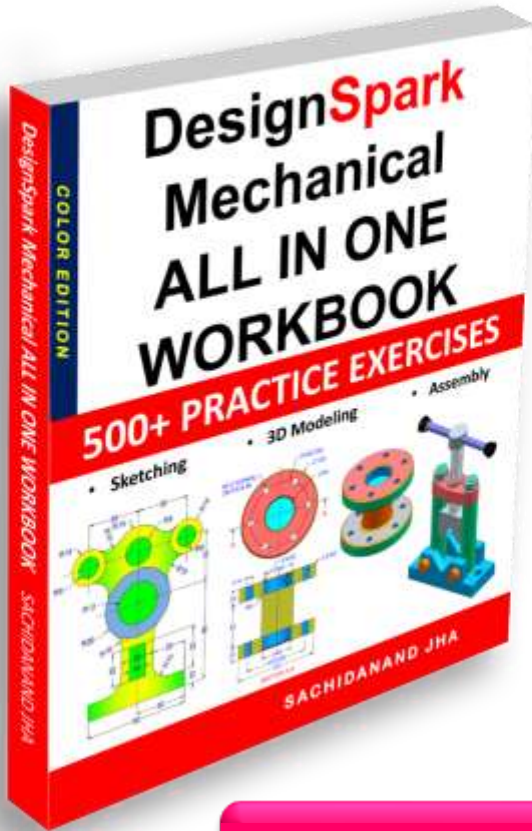




17	M8 OD 25MM WASHER	8
16	M8X1.25X20MM ROUNDED HEAD SCREW	8
15	M8X1.25X20MM HEX BOLT	4
14	M8 OD 15MM WASHER	2
13	M8X1.25X6.5MM HEX NUT	10
12	M8X1.25X65MM HEX BOLT	2
11	M10X1.5X8MM HEX NUT	1
10	M10X1.5X70MM HEX BOLT	1
9	M12X1.75X10MM HEX NUT	1
8	M12X1.75X140MM HEX BOLT	1
7	TOP PLATE RIGHT	1
6	TOP PLATE LEFT	1
5	BASE	2
4	CENTRAL SUPPORT	1
3	CENTRAL SUPPORT HOLDER	1
2	ARM	1
1	WALL MOUNTING PLATE	1
ITEM NO	PART NAME	QTY



# END OF ASSEMBLY SAMPLE



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– Team **Cadin360**



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- 200 3D Modeling Exercises
- Multi-part Assembly Exercises & Detailed Drawings
- All drawings in 3<sup>rd</sup> Angle projection
- All dimensions are in mm(metric system)