

# CGT 16300 : Graphical Communication and Spatial Analysis

Kedar Abhyankar, Lab section 21, Seat Number 01

# LAB PREP

- Different Planes exist
- Use planes to see object in different views
  - Profile is in "side view"
  - Frontal is... frontal
  - Inclined is inclined
  - Oblique is oblique plane, wider view

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Assignment #: 211P02

Date: 6/1/21/2020

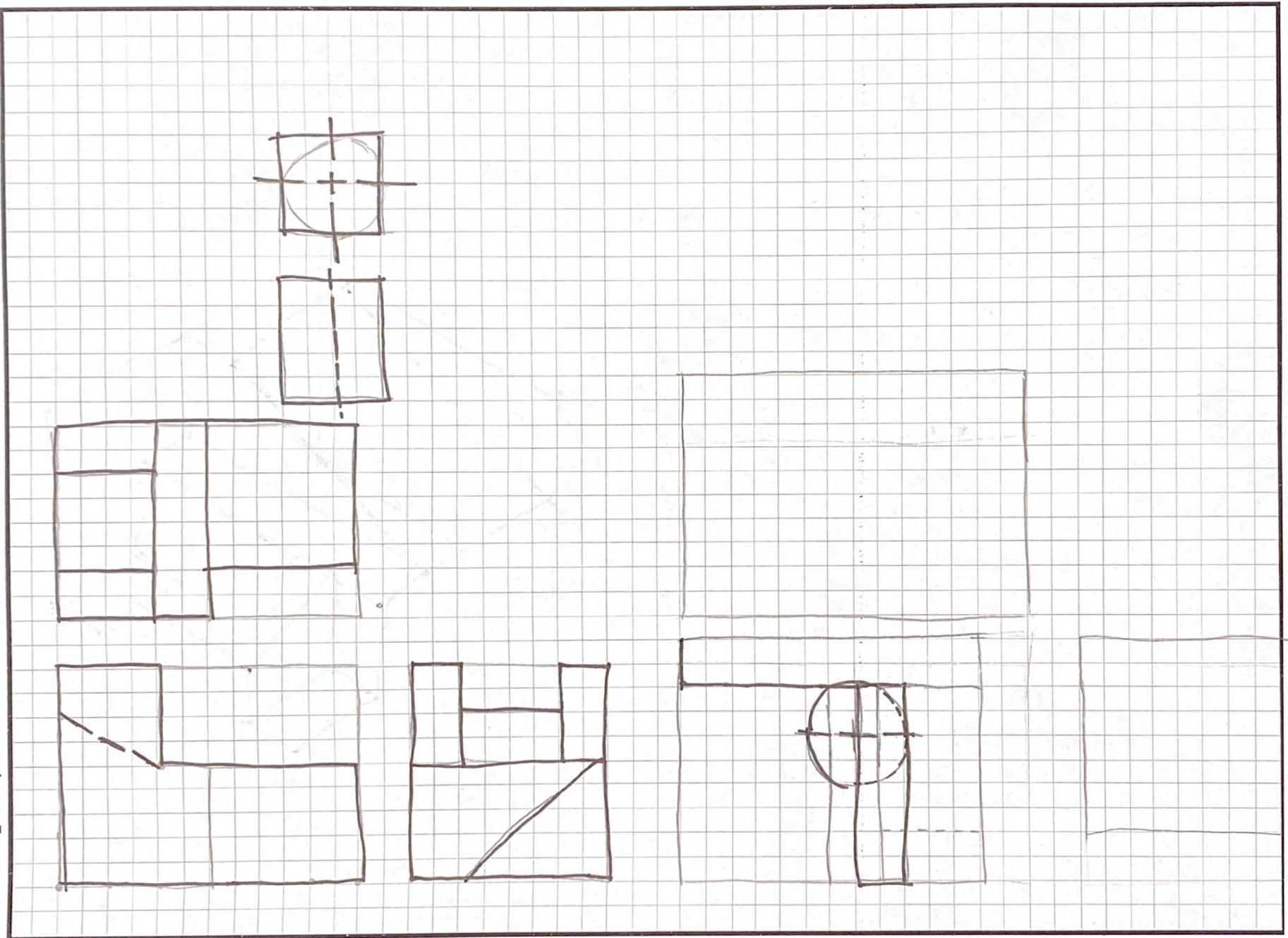
Z3 LAB PREP

HOMIKA KABHYAN

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Assignment #: Z1LPO3O1

Date: 01/28/2020



→ Simulation Player

↳ Allows to play tracks in sequence

→ Digital Mockup Slicing Workbench

→ grab a track  
↳ select part

→ compass cut adjusts to part

→ every time you move a part, stop  
recording

→ Name part, move it, Stop recording

→ to next part ↗  
if going out  
partName\_out

→ there are no constraints in this bfc. It is not an

assembly

↗ if going in  
partName\_in

→ make sure it says "First positioning"

→ Set Action Duration to 5

→ To reverse:

→ Click a part, Copy/Paste it into Tracks,

- Break Link  
- Reverse Time

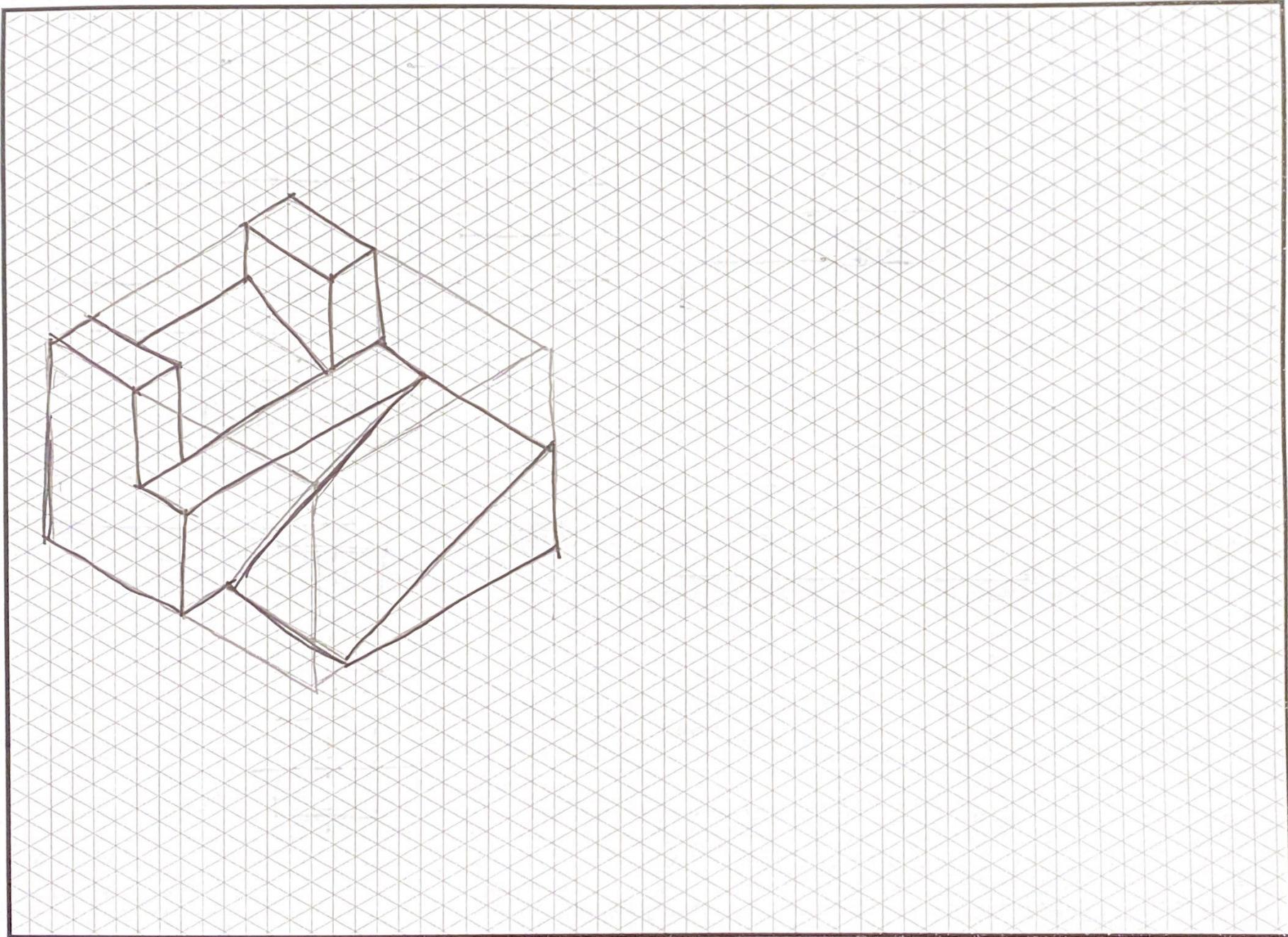
## 2 dimensional constraints

- make sure sketch tools is on
- turn off all constraints except for the last one
- make the lines tangent to the circle
  - right click & select tangency
- find operation toolbar
- select trim command
- Constrain all the shapes
- make everything rounded
- extrude is called pad in Catia
- enable hybrid design when creating part
- revolution is called shaft
- make all the shapes in blackboard

Hyunyank / LEVYK  
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Assignment #: 21LP0301

Date : 01/28/2010



→ Pattern  
→ 3D Geometry

→ Rim

→ Rounded profile

- Make sure to turn grid snap off

→ Axis

→ Constraints to get diameter

→ Profile

→ Axis

→ Constraint

→ Revolve

→ Thick profile

- Formulas are like constraints, but better
- Use patterning to duplicate things faster
- Don't cut corners, do the work
- Use positioning based on geometry not the planes.

# ASSIGNMENTS

NAME KEDAR ABHYANKAR

ASSIGNMENT # 210101

### Plane Identification

Match each plane in the isometric view with the corresponding planes in each of the orthographic views. Each number may be used once, more than once, or not at all. Some answers may remain blank. In the "SUP" column mark an "H" if the plane is horizontal, an "F" if it is a frontal plane, an "P" if it is a profile plane, an "I" if it is an inclined plane, and a "O" if it is an oblique plane. If a number has a leader, it indicates an "edge view" of the plane. If there is no leader, the number is directly on the indicated plane.

Figure 01

ISO	ORTHO	SUP
T	F	S
A	4	20 29 I
B	2	17 30 I
C	7	23 P
D	8	18 32 F
E	6	16 36 F
F	5	25 H
G	10	19 34 F
H	3	21 33 H
J	11	22 28 P
K	13	26 32 F
L	1	14 I
M	2	15 27 P

Figure 02

ISO	ORTHO	SUP
T	F	S
A	3	15 33 I
B	10	16 34 F
C	12	17 28 P
D	2	22 31 H
E	1	24 29 H
F	5	23 25 P
G	6	13 32 F
H	4	14 30 F
J	9	19 P
K	8	21 26 P
L	7	20 27 P

Figure 03

ISO	ORTHO	SUP
T	F	S
A	8	12 27 P
B	3	17 29 H
C	9	18 25 P
D	6	16 30 F
E	5	15 21 I
F	2	13 24 I
G	4	28 26 O
H	10	19 20 F
J	1	11 22 H
K	7	14 23 F

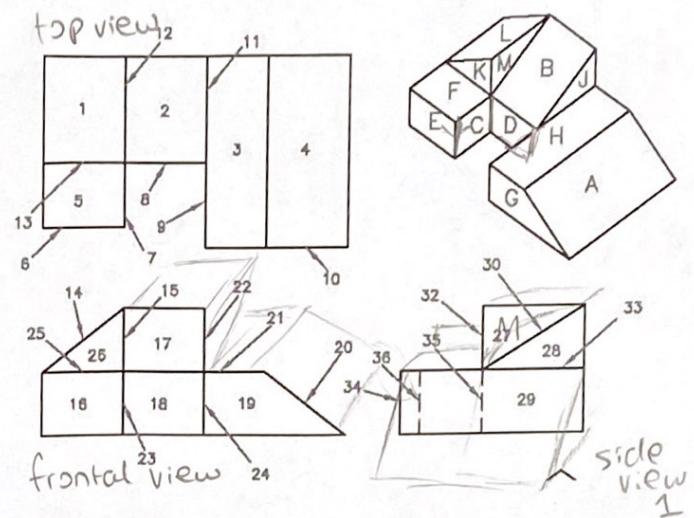


Figure 01

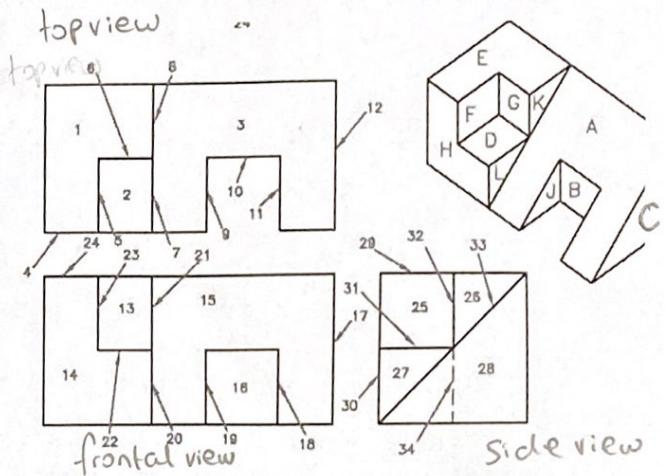


Figure 02

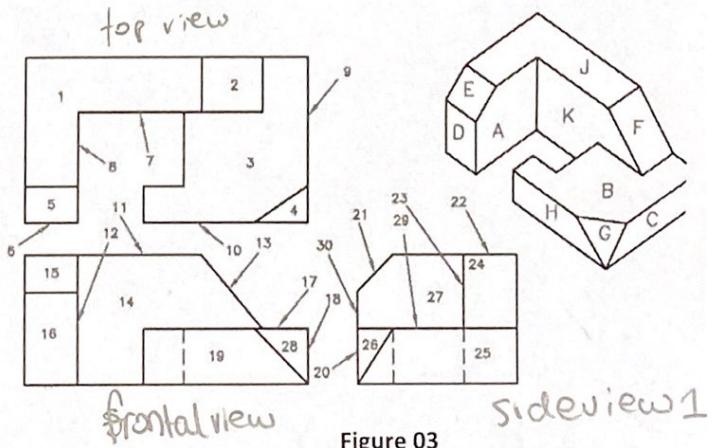


Figure 03

## CGT 163 Spatial Analysis and Graphics Communication Syllabus Spring 2020



*"As a Boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do.  
Accountable together - we are Purdue."*

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### Course Director

Professor Craig L. Miller, Ph. D. – [miller02@purdue.edu](mailto:miller02@purdue.edu) – 337 Knoy Hall of Technology

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### Instructor Office Hours

	Monday	Tuesday	Wednesday	Thursday	Friday
7:30			Mr. Zhiwen Cao KNOY 335		
8:30			Mr. Zhiwen Cao KNOY 335		
9:30			Mr. Zhiwen Cao KNOY 335	Mr. Syed Faaiz Hussai KNOY 335	
10:30				Mr. Agam Mehta KNOY 335	Mr. Ana Dalipi KNOY 335
11:30					Mr. Ana Dalipi KNOY 335
12:30	Mr. Mathew Spinazolla KNOY 335				Mr. Ana Dalipi KNOY 335
1:30	Mr. Mathew Spinazolla KNOY 335	Mr. Tianyu hou KNOY 335			
2:30	Mr. Agam Mehta KNOY 335	Mr. Tianyu hou KNOY 335	Mr. Agam Mehta KNOY 335	Mr. Mathew Spinazolla KNOY 335	Mr. Syed Faaiz Hussai KNOY 335
3:30		Mr. Tianyu hou KNOY 335		Mr. Syed Faaiz Hussai KNOY 335	
4:30					

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### Course Description

CGT 163 is an introductory course in computer graphics applications for mechanical and aeronautical related professions. Experiences focus on visualization, sketching, graphic standards and problem-solving strategies for engineering design. The course will emphasize the proper use of parametric solid modeling for design intent.

## Course Objectives

1. Describe the importance of engineering/technical graphics in the design of made products.
2. To advance your spatial abilities that would allow you to successfully communicate engineering ideas using visual techniques. (foundational applied understanding)
3. Utilize two- and three-dimensional geometry for engineering and technical applications.
4. Apply basic industry graphics standards to engineering design.
5. Sketch basic freehand representations of technical concepts.
6. Demonstrate proficiency using basic 3D computer-aided design (CAD) processes.

## Required Materials

- **Textbook**

Please purchase the bundle for the following book:  
This bundle includes:

**Applied Geometry for Engineering Design, Miller, C.L.**

**Essentials of Product Data Management: Enabling the Digital Enterprise, Camba, Mueller, Fuerst**

<http://www.cacademicbooks.com/BookDetail.asp?product=CGT%20163>  
*Notes: Make sure you purchase the **bundle** instead of the individual book.*

- **Sharpie Pen**

- Non-bleed black sharpie pen (fine point)
- Not a Sharpie permanent marker



- **.5 Mechanical Pencil**

ade products.  
te

## Grading

Activity	Percentages	Grading Scale	Grade*
Assignments	040%	98	A+
Quizzes	020%	92	A
Final Project	030%	89	A-
Digital Portfolio	010%	87	B+
Total	100%	82	B
		79	B-
		77	C+
		72	C
		69	C-
		67	D+
		62	D
		59	D-
		00	F

- Regardless of the above percentages, **any student who fails to submit by the posted deadlines 13 or more assignments** will receive a failure (F) for the course.
- Regardless of the above percentages, **any student who fails to attend four (4) or more Laboratory Preparation (LP) lectures** will receive a failure (F) for the course.
- **All email correspondence has the following requirements:**
  - The email subject line must be as follows:
    - CGT 163 – XX (XX = lab #). If this requirement is not met the email will be trashed without being read.
    - Any email correspondence sent to Dr. Miller must be copied to the student's laboratory instructor.
    - Any email that you send that asks a question that the information in your question can be found in the CGT 163 syllabus will result in ten (10) deduction from your assignment points. Please read the syllabus before asking a question that you already have the answer for!

## Lecture Expectations

- You are expected to attend all lectures, after all you have paid for them!
- No electronic devices (laptops, mobile phones, handhelds, etc.) are permitted to be used in lecture, unless specifically allowed by the course supervisor. A 50-assignment-point penalty can be accessed per occurrence.
- Sleeping is not permitted in lecture. A 50-assignment-point penalty will be accessed per occurrence.

## Assignments

- CGT 163 assignments include freehand sketching, CAD, and others.
- Every assignment (both CAD and sketching) will have a corresponding naming convention to assist in quick return of graded materials and also represents industry naming conventions. The naming convention, demonstrated below, will also correspond to the filename of any saved CAD homework. You are REQUIRED to use this naming convention or major points will be deducted from your score.

002309      00 Section number corresponding to your class schedule  
                23 Your assignment number  
                09 Assigned seat number in your laboratory

- Assignments are due the next laboratory session:
  - Sketch assignments will be collected at the beginning of the next laboratory session.
  - CAD assignments will be submitted to Blackboard Learn no later than 11:59 p.m. the day prior to the to your assigned lab session of the following week. *Example: A CAD assignment released at the beginning of Week 02 will be due at 11:59 p.m. the day prior to your lab in Week 03.*
  - Assignments will be graded by laboratory instructor in lab.
- Late assignments will NOT be accepted, unless prior arrangements are made with your instructor.
- No assignment due in the labs can be made up for receiving credit unless you hold a valid reason for absence and prior arrangements are made with your instructor.
- No lecture assignment can be made up for receiving credit unless you hold a valid reason for absence and prior arrangements are made with your instructor.
- You must be present in laboratory to receive credit for laboratory assignments. This is when the most assignments are graded and performance feedback is individually given.  
**Even if you make the submission deadline on Blackboard Learn you still must come to laboratory to receive credit for the assignments.**
- Having someone else turn in any assignment(s) for you so that you do not attend a lecture, laboratory preparation, or laboratory will result in a grade of zero being assigned to all assignments that are due.
- If you do not agree with the grade that you received from your laboratory instructor the course director will re-grade your work and you will be assigned the new grade from the re-grade of your work by the course director.
- Any questions regarding the grade assigned on an assignment or a test must be directed to your laboratory instructor or the course director within **two weeks** of the assignment deadline date or the date of the test administration.

## Lecture and Laboratory Attendance

- You are expected to attend all CGT 163 lectures and your own laboratory sessions.
- You are being allowed for five minutes (5) late for laboratory sessions. If you are not able to arrive at the lab room due to time conflict on a regular basis, you need to make arrangement with your laboratory instructor.
- **Being absent for any lecture or laboratory session WITHOUT a valid reason will result in zero point for any lecture notes or assignments due in that lecture or lab.**
- If you must miss a lecture, laboratory preparation, or laboratory **WITH** a valid reason (attending conference, job interview, military leave, etc.), you need to contact your instructor **PRIOR** to your lecture, laboratory preparation, or laboratory **in a timely fashion** and make any necessary arrangements.
- If you are ill and cannot attend your lecture, laboratory preparation, or laboratory then you need to contact your instructor **via email** before the end of the lecture, laboratory preparation lecture or laboratory for any consideration of a deadline extension.

## Academic Honesty/Dishonesty

Students are encouraged to work together but **each student is required to do their own work**. Standards set by Purdue University as outlined in the Student Handbook and the University Regulations (current edition) will be observed in this course. Any student found participating in cheating, plagiarism, copying material from another person's disk, using illegal cribs or other materials forbidden during a written or practical examination, lying to course instructors and/or lab assistants about his/her work, stealing tests, quizzes, or answer keys, or any such like activities will be considered in conflict with the printed academic honesty guidelines as set out by Purdue University, Purdue Polytechnic Institute, and Department of Computer Graphics Technology. All matters that arise in regards to students being found to be in conflict with these guidelines will be reported to the Office of the Dean of Students, and the appropriate Purdue University administration officers, for consideration and possible disciplinary action. **BOTTOM LINE: IF YOU ARE CAUGHT CHEATING IN CGT 163 YOU WILL EARN A FAILING COURSE GRADE AND BE REPORTED TO THE DEAN OF STUDENTS; NO EXCEPTIONS.** Incidents of academic misconduct in this course will be addressed by the course instructor and referred to the Office of Student Rights and Responsibilities (OSRR) for review at the university level. In addition, all incidents of academic misconduct will be forwarded to OSRR, where university penalties, including removal from the university, may be considered. Students may refer to the [Purdue University Student Conduct Policy](#).

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breeches of this value by either emailing [integrity@purdue.edu](mailto:integrity@purdue.edu) or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

## Counseling and Psychological Services (CAPS) Information

Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765) 494-6995 and <http://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or through its counselors physically located in the Purdue University Student Health Center (PUSH) during business hours.

## Emergency Notification Procedures

**EMERGENCY NOTIFICATION PROCEDURES** are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.

- **Indoor Fire Alarms** mean to stop class or research and immediately **evacuate** the building. Proceed to your Emergency Assembly Area away from building doors. **Remain outside** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.
- **All Hazards Outdoor Emergency Warning Sirens** mean to immediately seek shelter (**Shelter in Place**) in a safe location within the closest building. o "Shelter in place" means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, a civil disturbance including a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency\*. **Remain in place** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

\*In both cases, you should seek additional clarifying information by all means possible...Purdue Home page, email alert, TV, radio, etc...review the Purdue Emergency Warning Notification System multi-communication layers at [http://www.purdue.edu/ehps/emergency\\_preparedness/warning-system.html](http://www.purdue.edu/ehps/emergency_preparedness/warning-system.html)

### Review the Emergency Procedures Guidelines

[https://www.purdue.edu/emergency\\_preparedness/flipchart/index.html](https://www.purdue.edu/emergency_preparedness/flipchart/index.html)

- Review the **Building Emergency Plan** (available from the building deputy) for:
  - evacuation routes, exit points, and emergency assembly area,
  - when and how to evacuate the building,
  - shelter in place procedures and locations,
  - additional building specific procedures and requirements.

### EMERGENCY PREPAREDNESS AWARENESS VIDEOS

"Shots Fired on Campus: When Lightning Strikes," is a 20-minute active shooter awareness video that illustrates what to look for and how to prepare and react to this type of incident. See:

<http://www.purdue.edu/securePurdue/news/2010/emergency-preparedness-shots-fired-on-campus-video.cfm> (Link is also located on the EP website)

### MORE INFORMATION

Reference the Emergency Preparedness web site for additional information:

[http://www.purdue.edu/emergency\\_preparedness](http://www.purdue.edu/emergency_preparedness)

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### Intellectual Property (IP)

For concerns about IP, including IP resulting from student participation in course assignments, see Purdue University's [Policy VIII.4.1, Intellectual Property](#)

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### Minor

An engineering/technical graphics minor focused on product lifecycle management (PLM) is available from The Department of Computer Graphics Technology.

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### Acknowledgement of Course Policies

As a Boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue. I have read and understood all aspects of the CGT 163 syllabus and my expectations to be successful in CGT 163 and agree to adhere to them.

ABHYANKAR, KEDAR

Last & First Names  
(Printed in black ink)

  
Signature  
(Signed in black ink)

111712019

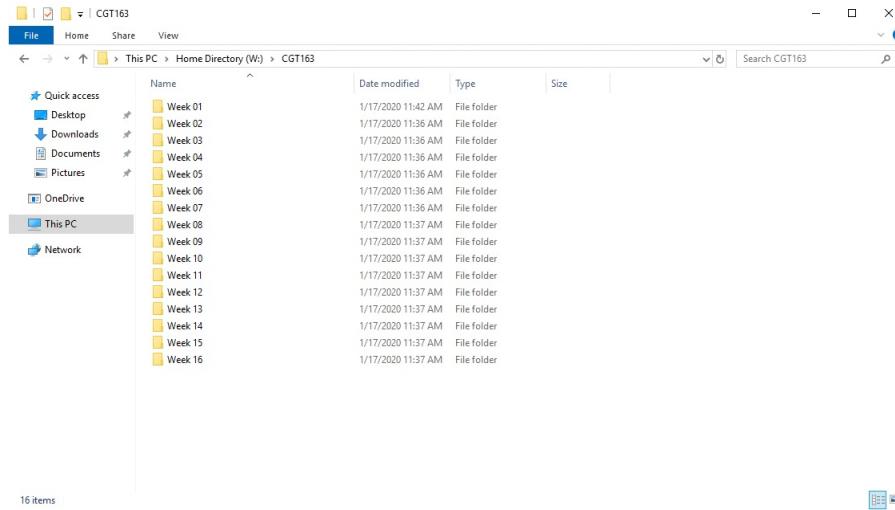
Date  
(Printed in black ink)

210201

Assignment #  
(Signed in black ink)

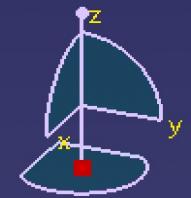


We thank you for your time spent taking this survey.  
Your response has been recorded.

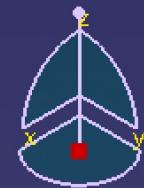
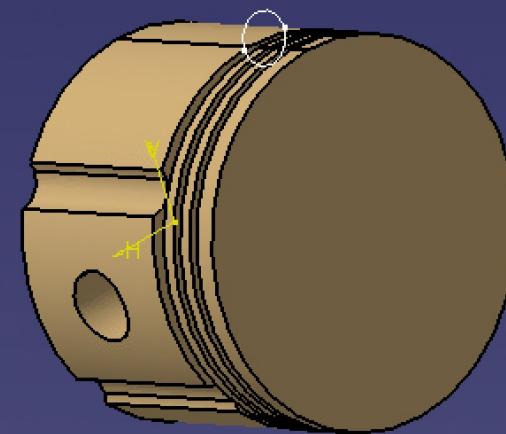


Dr. Miller Did not  
Come to class

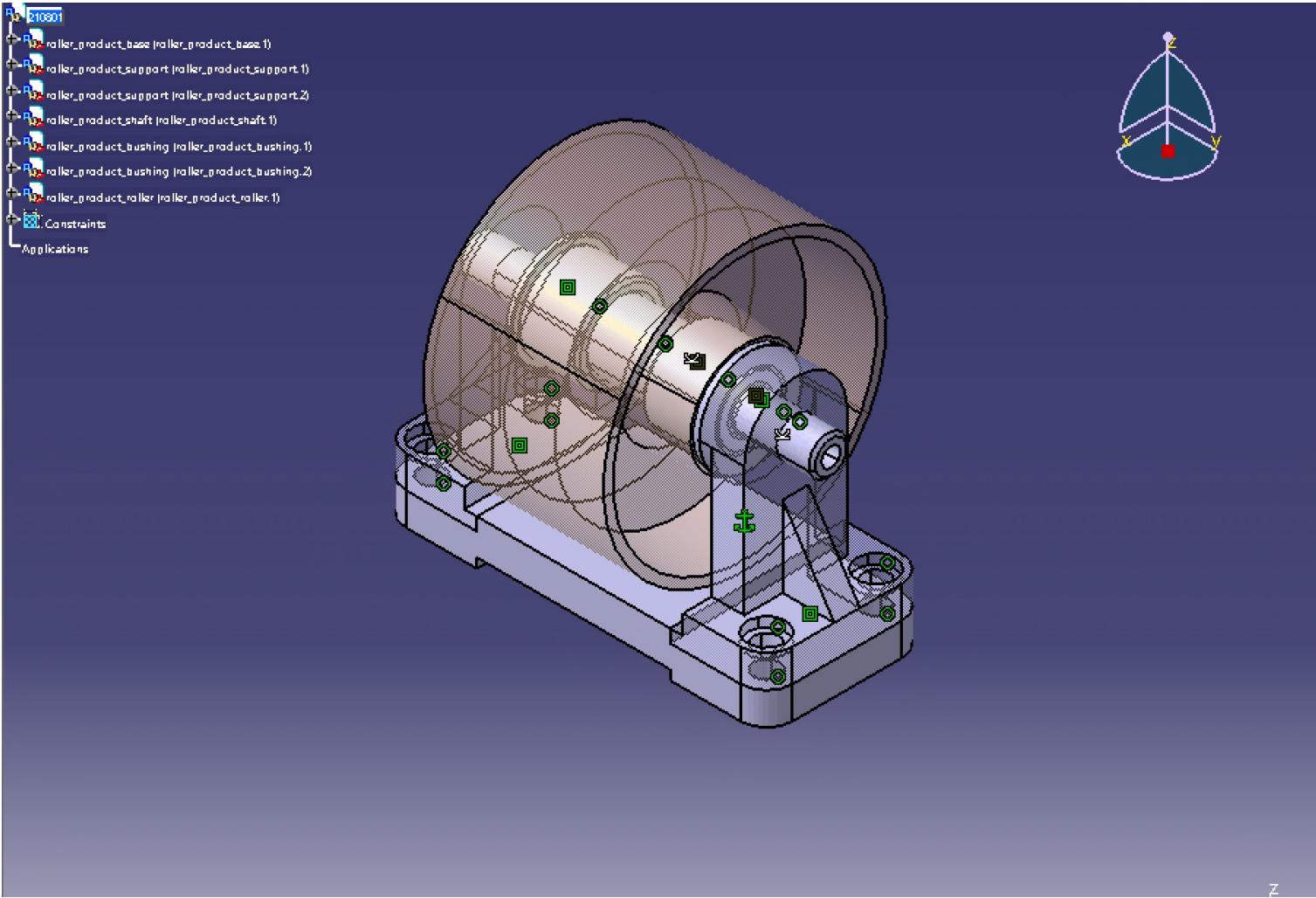
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- yx plane (frontal)
- zx plane (profil)
- PartBody

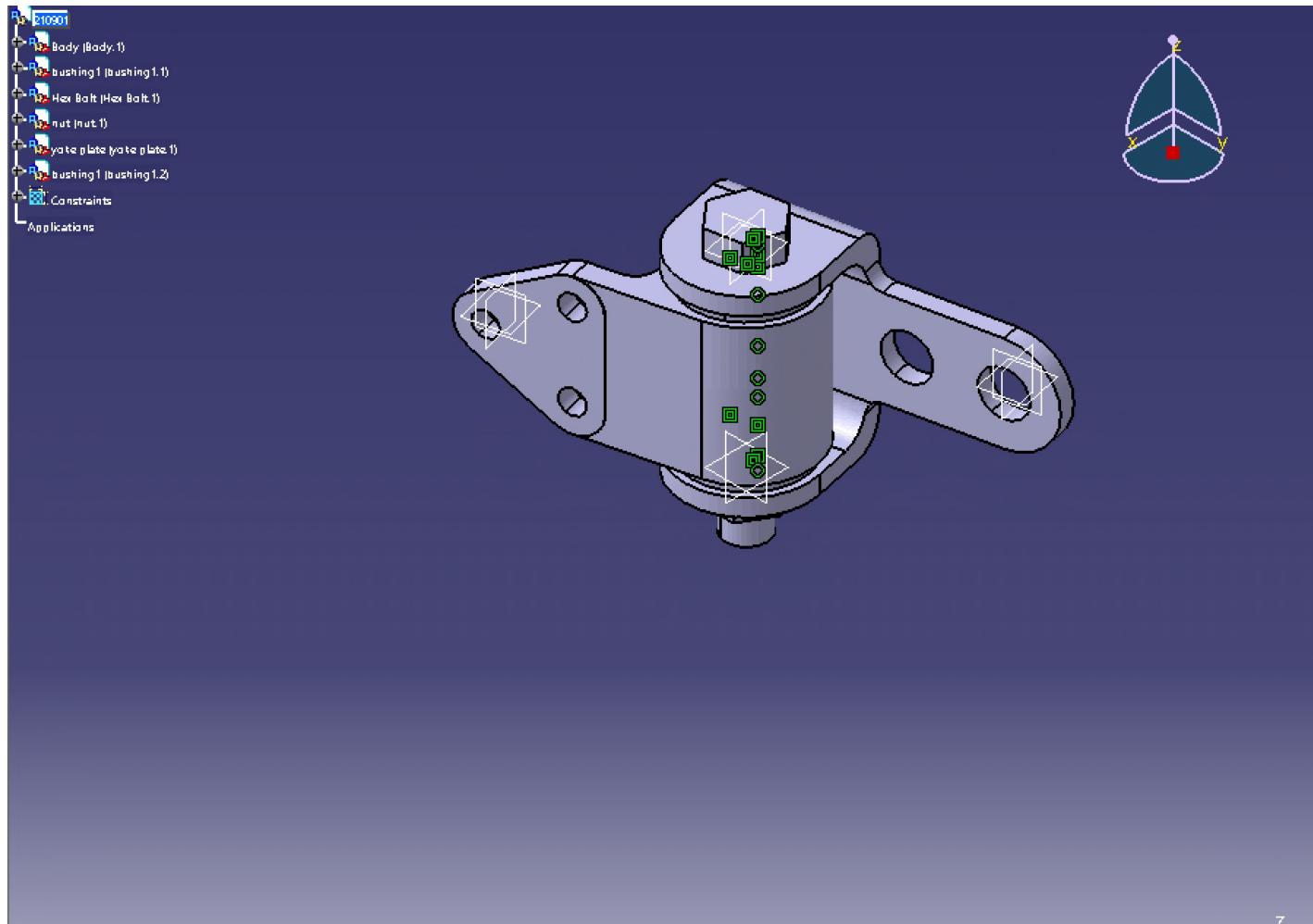


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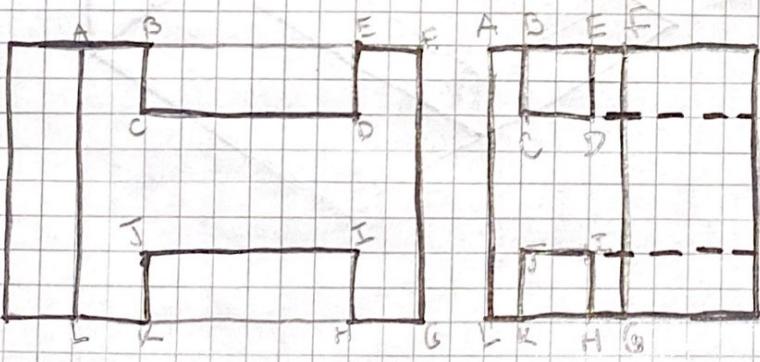
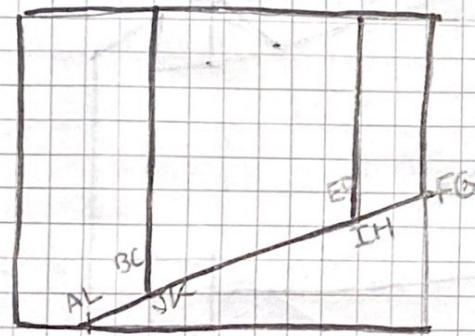


- Do stuff in Lab
  - ↳ Ask Questions to TA
  - ↳ Everything due by next Thursday @ midnight (RIF)
- Render Product to assignment code (XXYYZZ)
  - ↳ Section Assignment Seat #
- Do the constraints (parallel and touching/contact)
- assemble part

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Assignment #: 21101

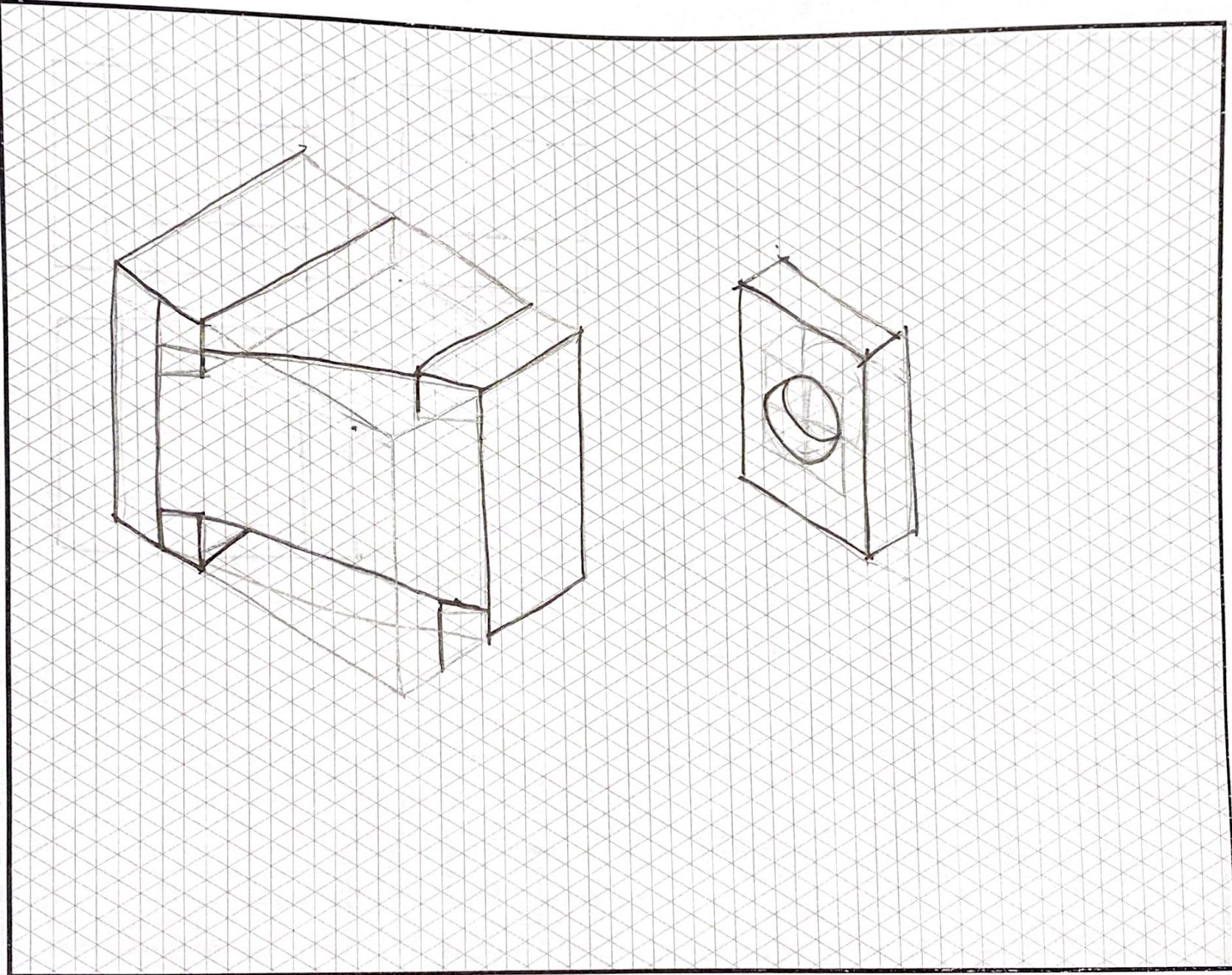
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TXID: 8A564040547444517  
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Assignment #: 211101

Date : 1/30/2020

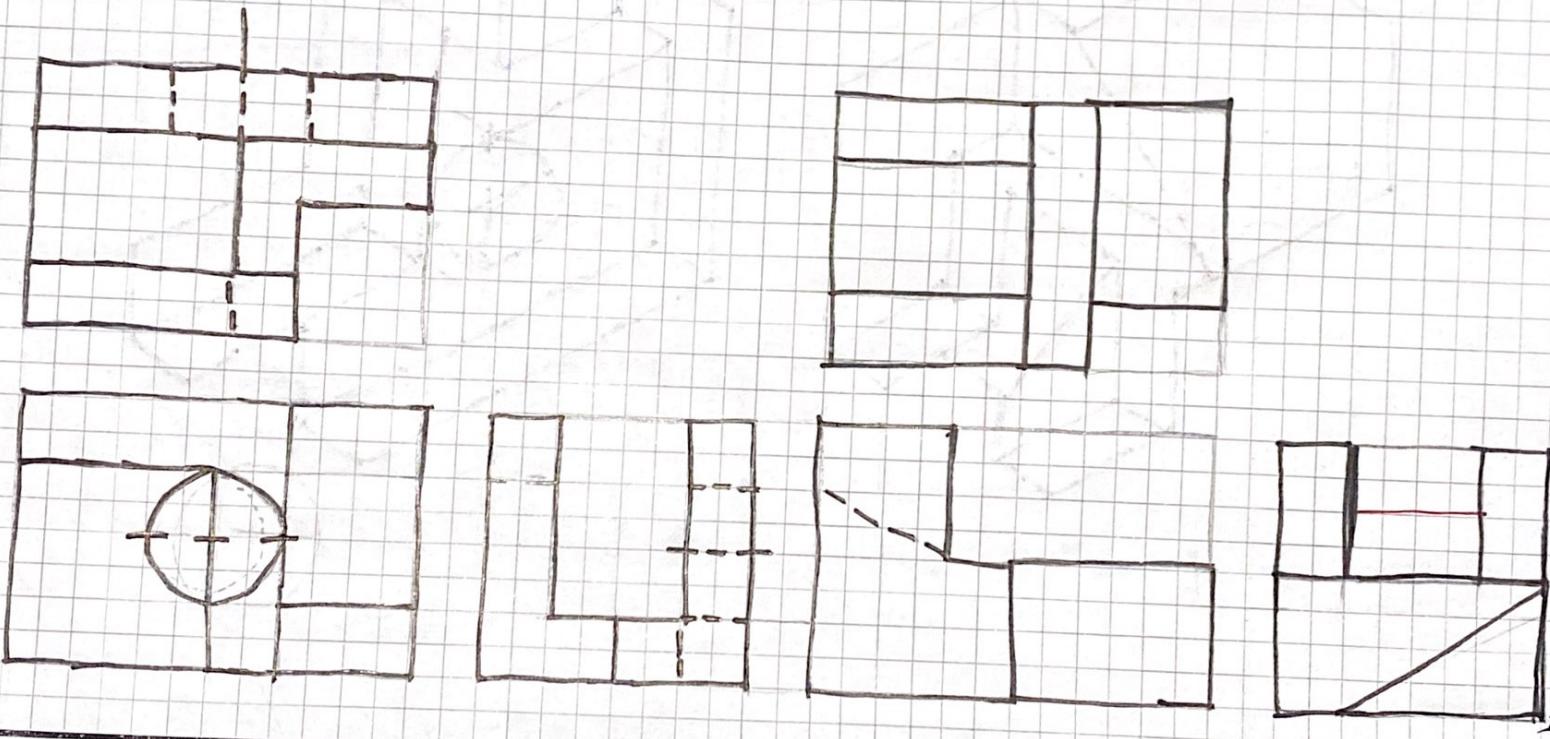


ABHYANKAR, KEDAR  
TXID: 8A564040547444512  
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1/31/2020

Date: 1/31/2020  
Assignment #: 211201

(a)



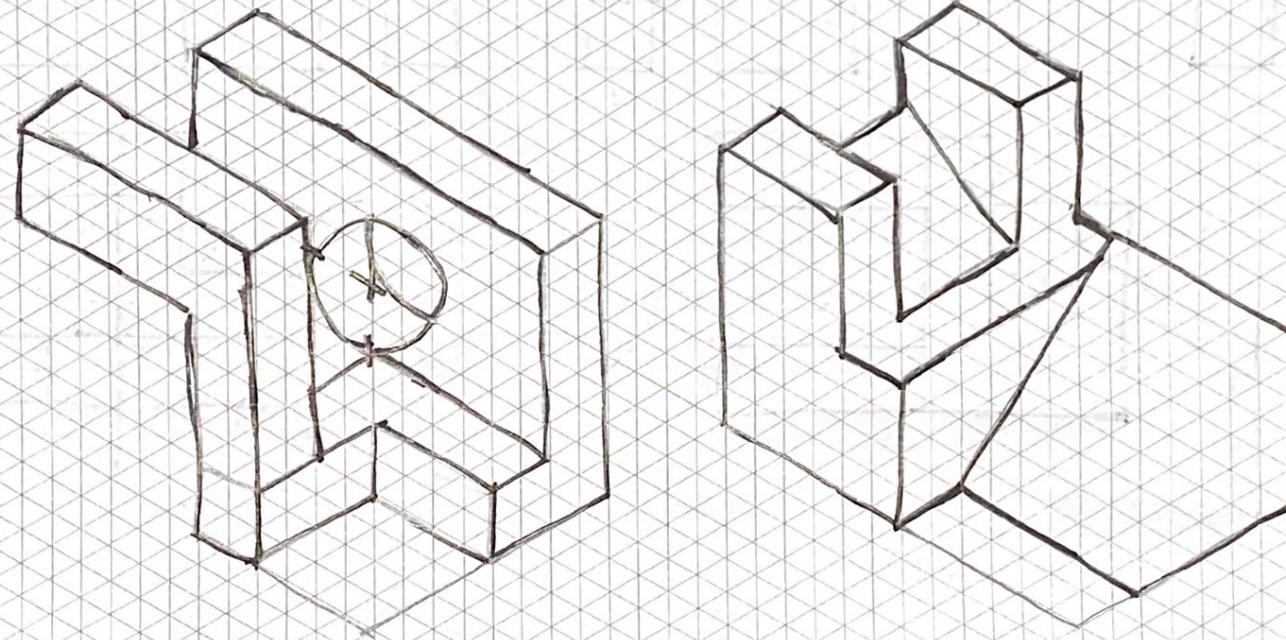
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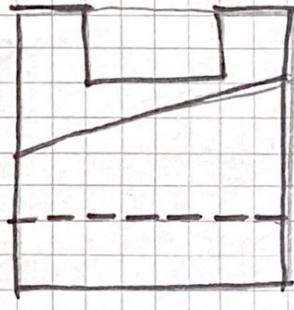
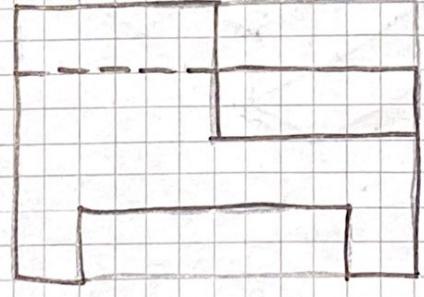
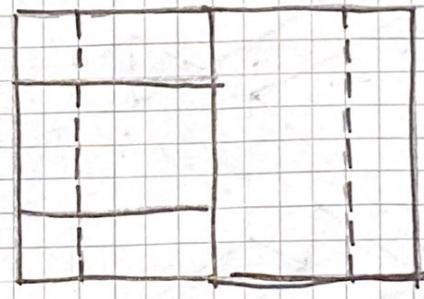
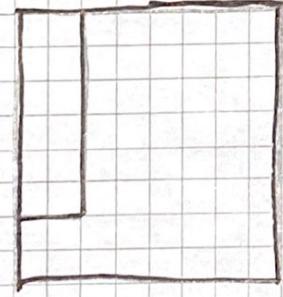
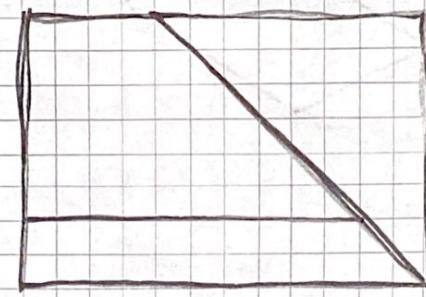
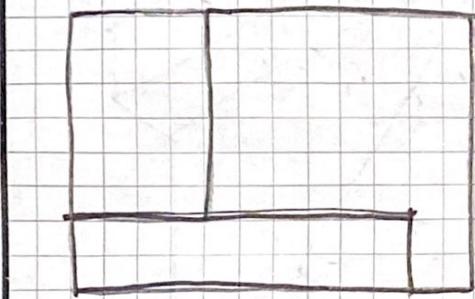
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TXID: 80564040547444512  
kabhyanik@purdue.edu

Assignment #: 211301

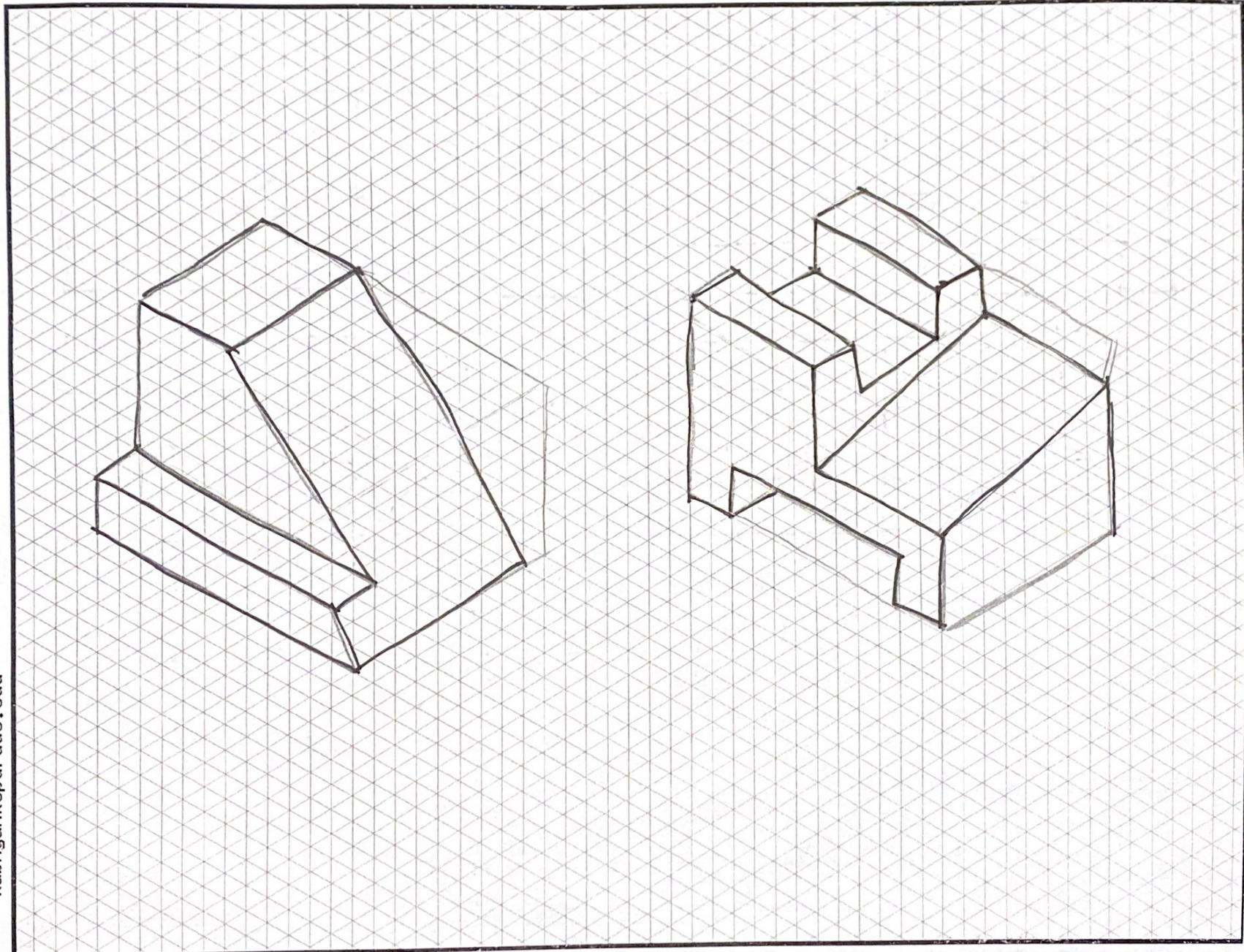
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kabhyank@purdue.edu

Assignment #: 211301

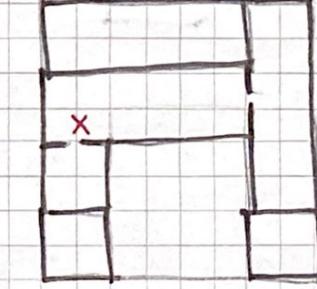
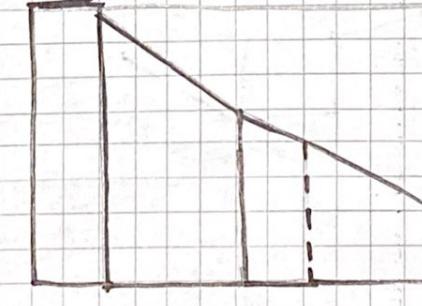
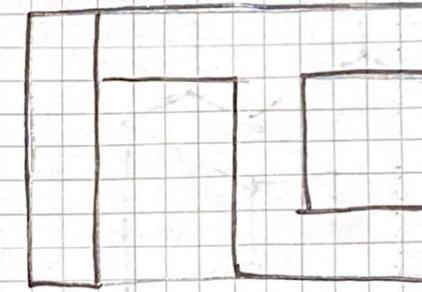
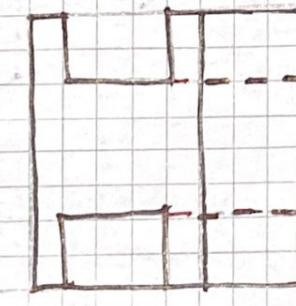
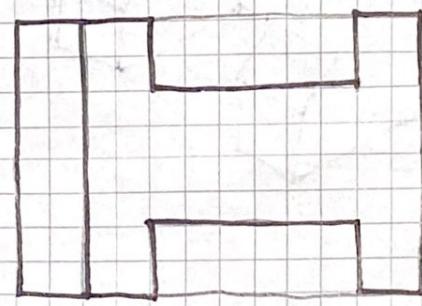
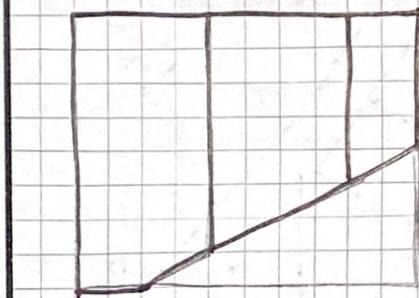
Date : 1/31/2020



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kabhyank@purdue.edu

Assignment #: 21401

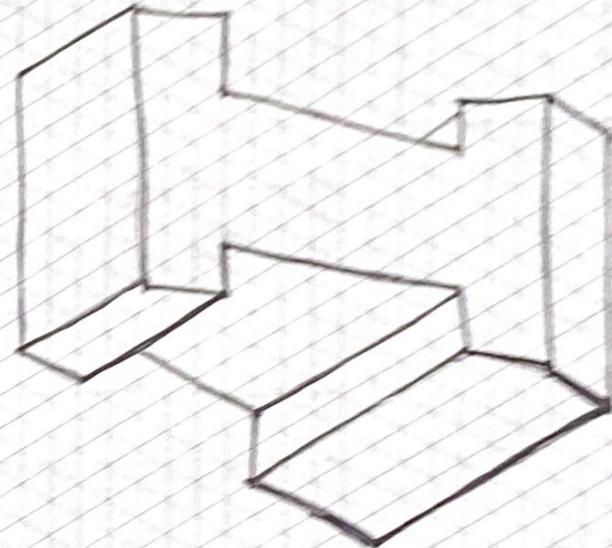
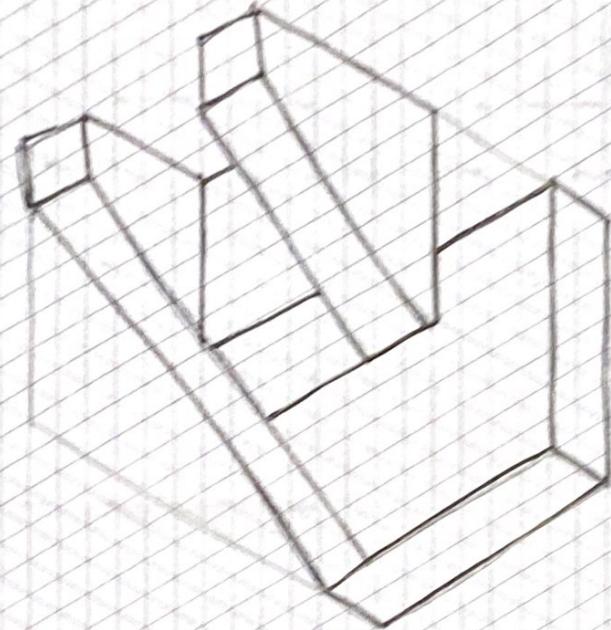
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TXID: 89564040547444517  
Kabhuank@purdue.edu

Assignment: 21401

Date: 1/31/2020

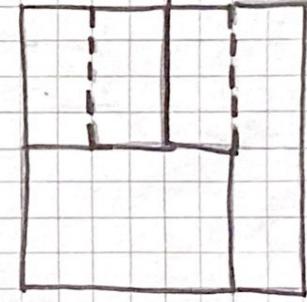
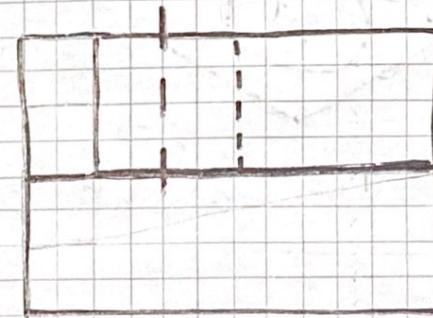
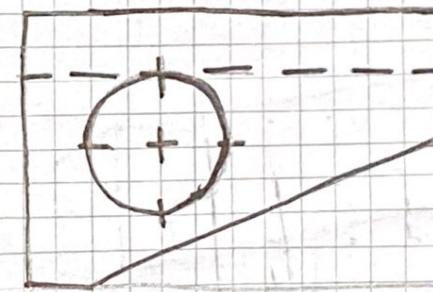
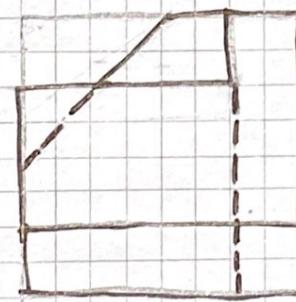
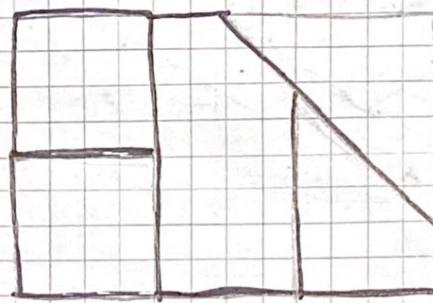
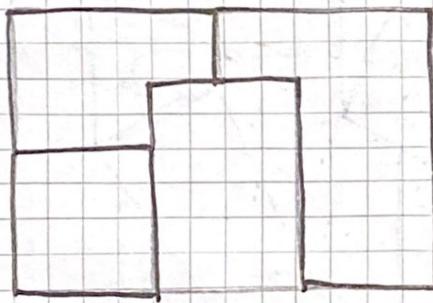


TXID: 8AS6404054744451Z  
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Assignment #: 211501

Date: 1/31/2020

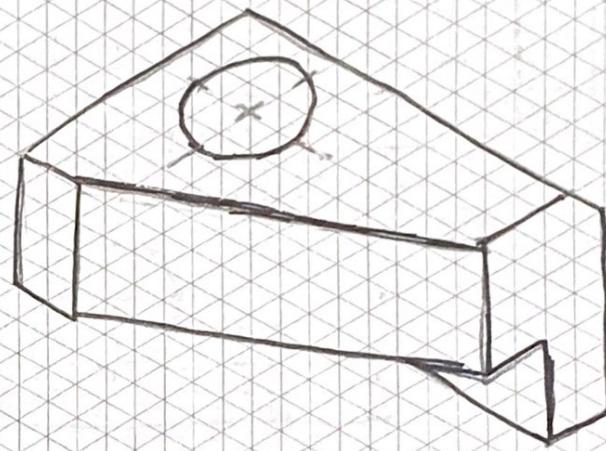
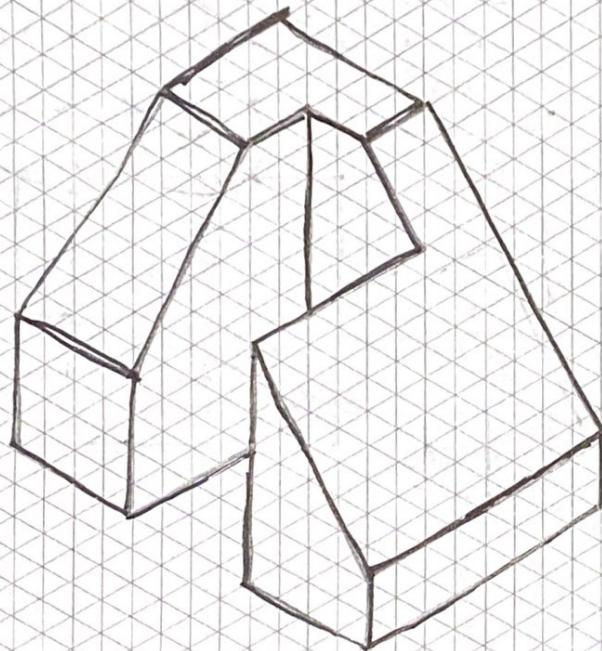
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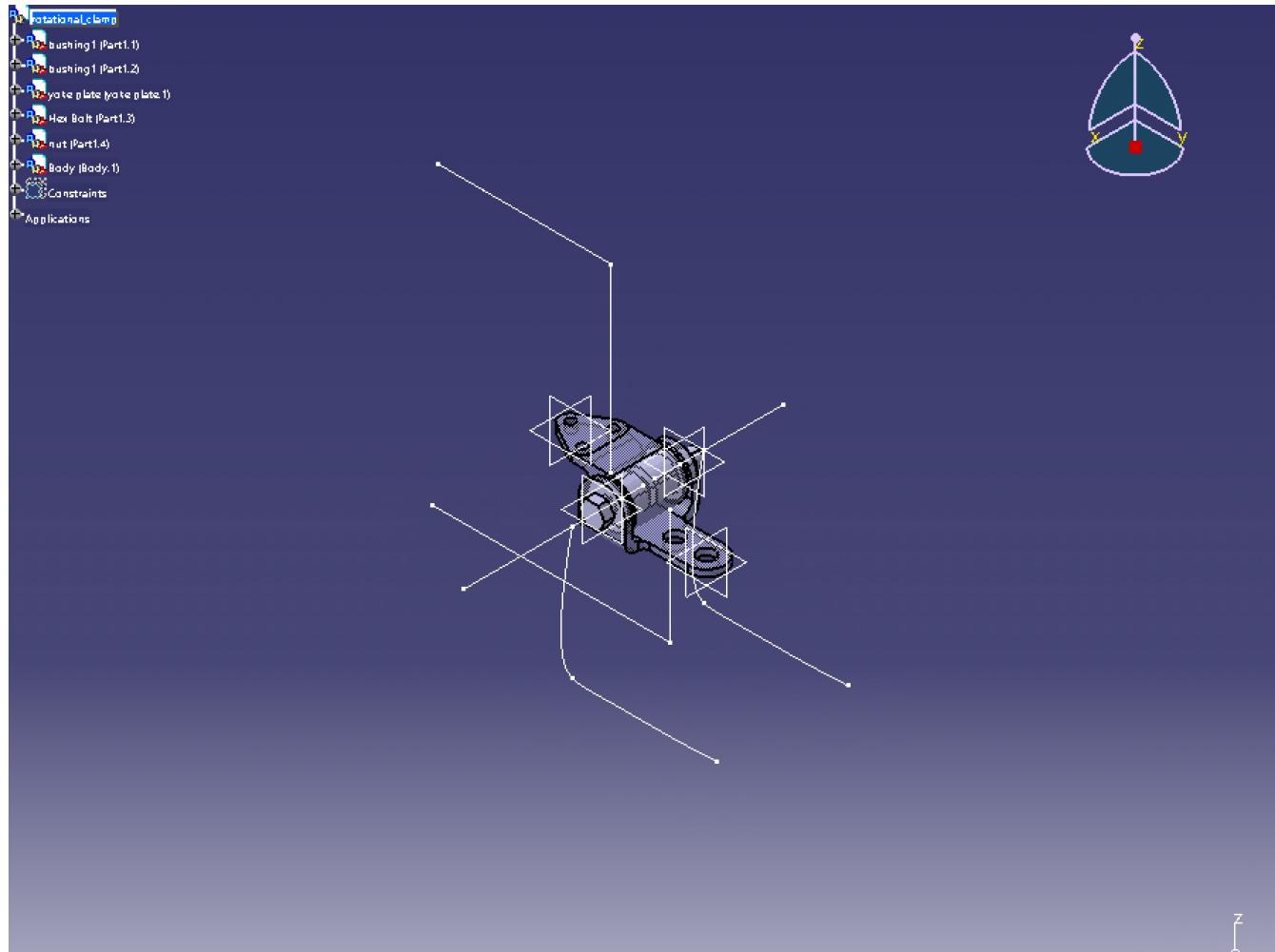


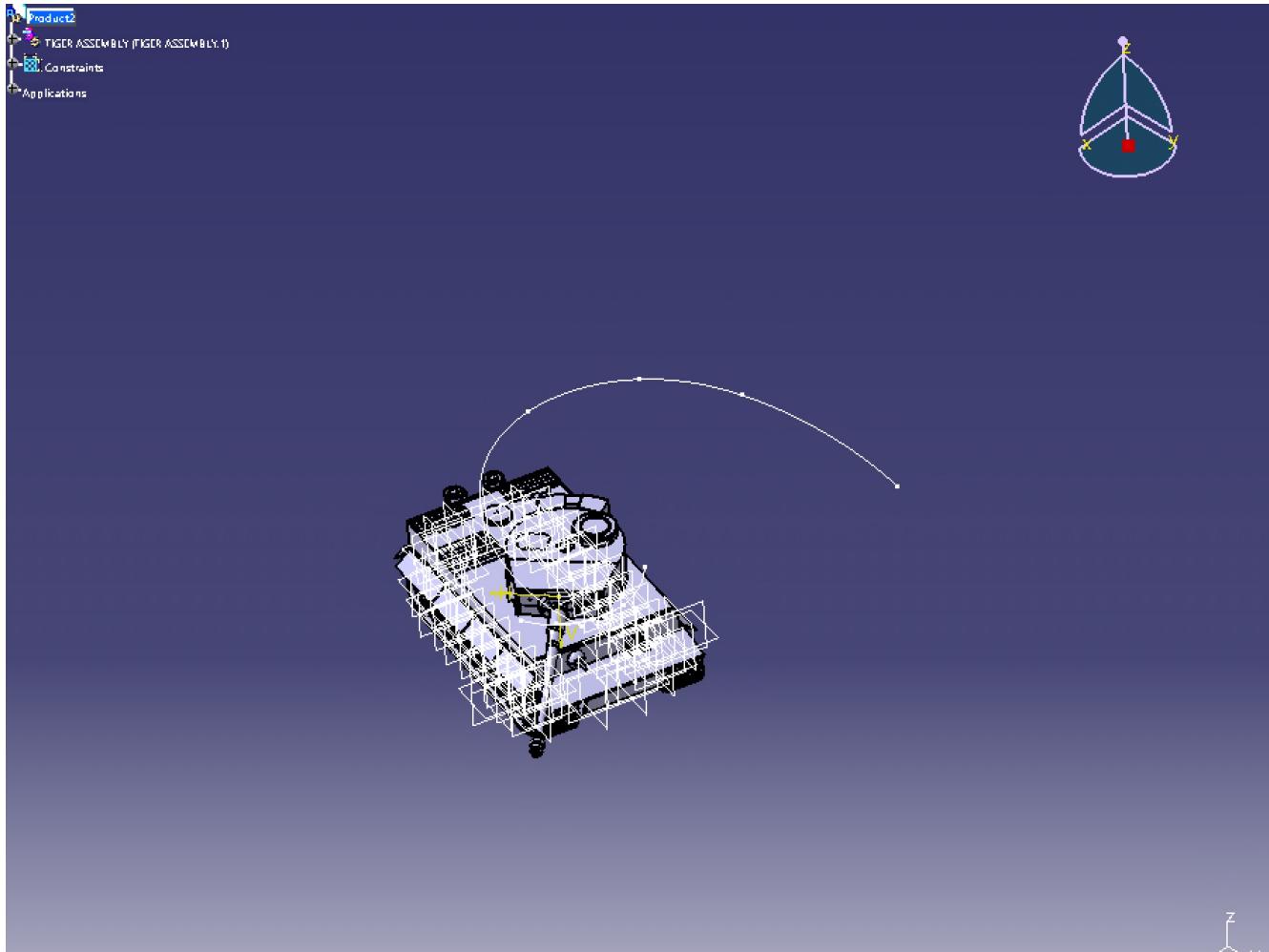
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Assignment #: 211501

Date : 1/31/2020

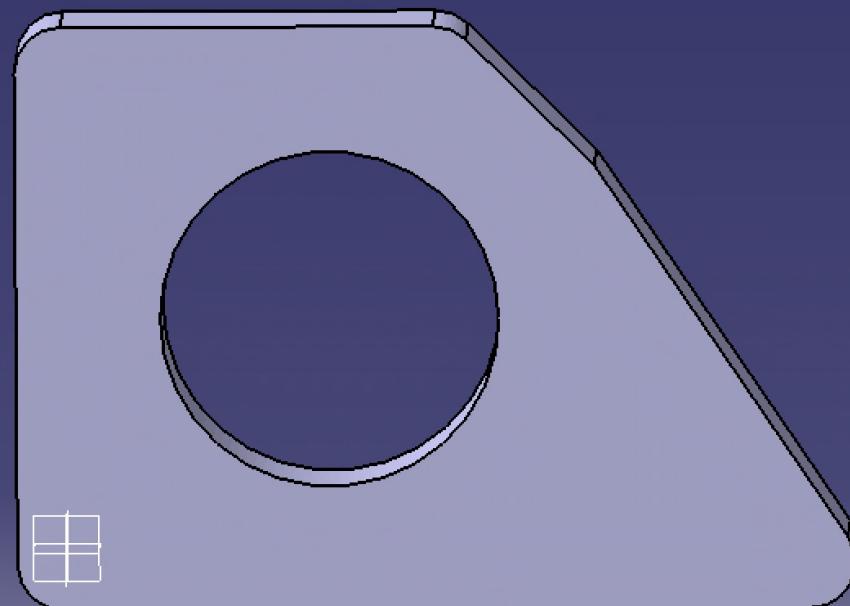
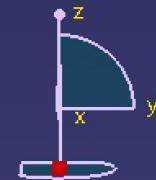




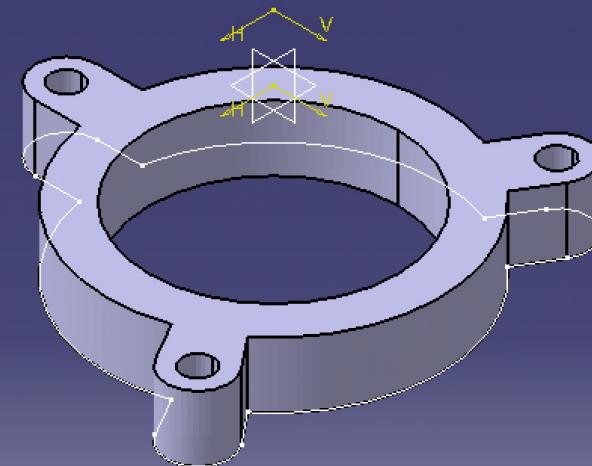


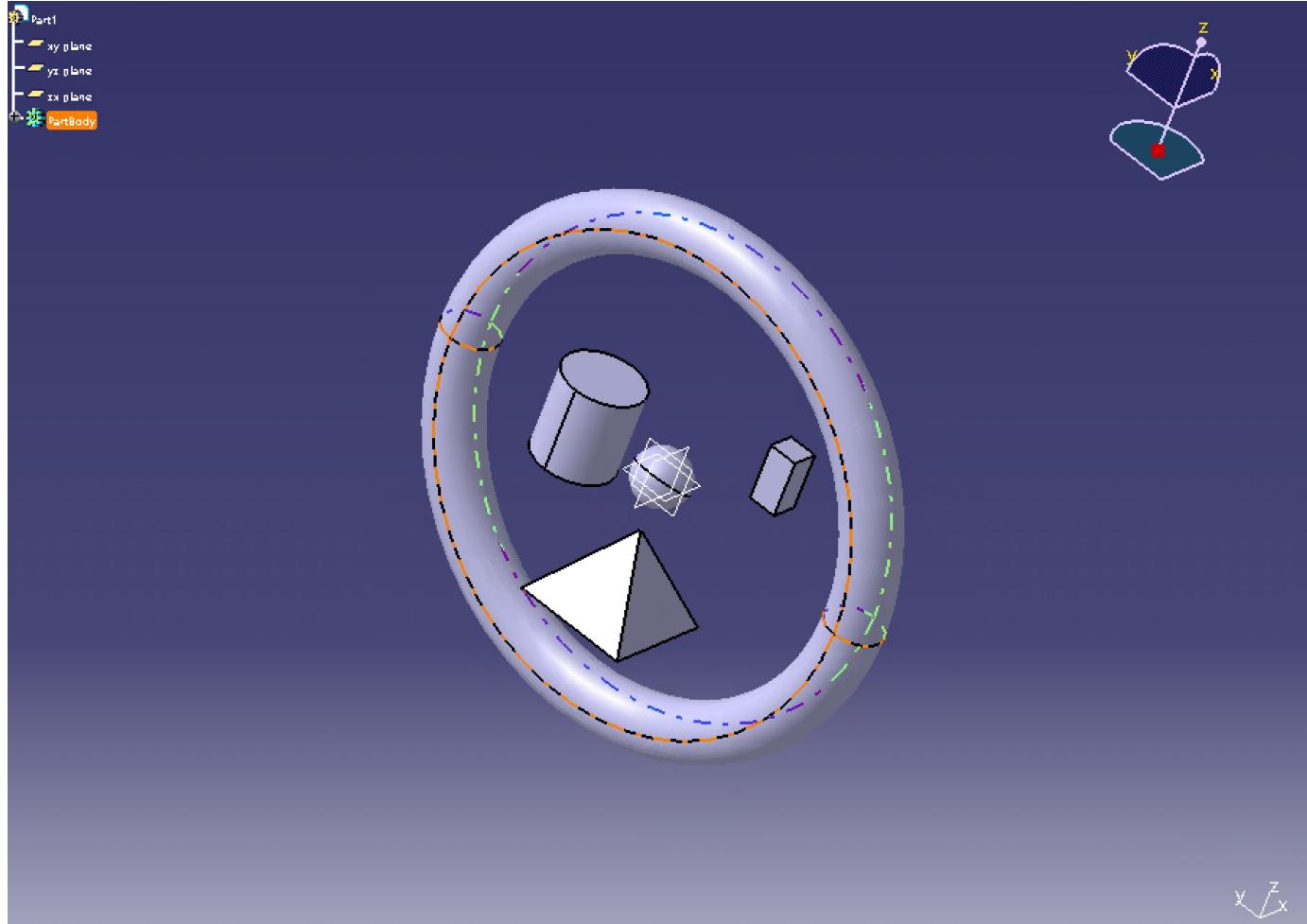
- Digital Mockup View / Simulation
- Open .CATProduct
- Hide Constraints
  - ↳ right click
  - ↳ hide
- Want to break CATproduct into individual assemblies
- Break down into three subdirectories: one for tankcar, one for barrel, one for turret
  - Need new component in reference to Product01
    - rename Product01 to Subdirectory name (Tank, Barrel, Turret)
  - Subcreate products

Part2  
xy plane  
yz plane  
zx plane  
PartBody



startpart  
xy plane (horizontal)  
yz plane (frontal)  
zx plane (profile)  
PartBody





Squares

Dimensions

Transformation Toolbar

Circle

→ Circumference

→ Size

Pad

→ UP to top

Hole

→ UP to plane



- Pad.2
  - Sketch.18
- Pad.3
  - Sketch.19
  - Sketch.20
- AbsoluteAxis
- User-edges

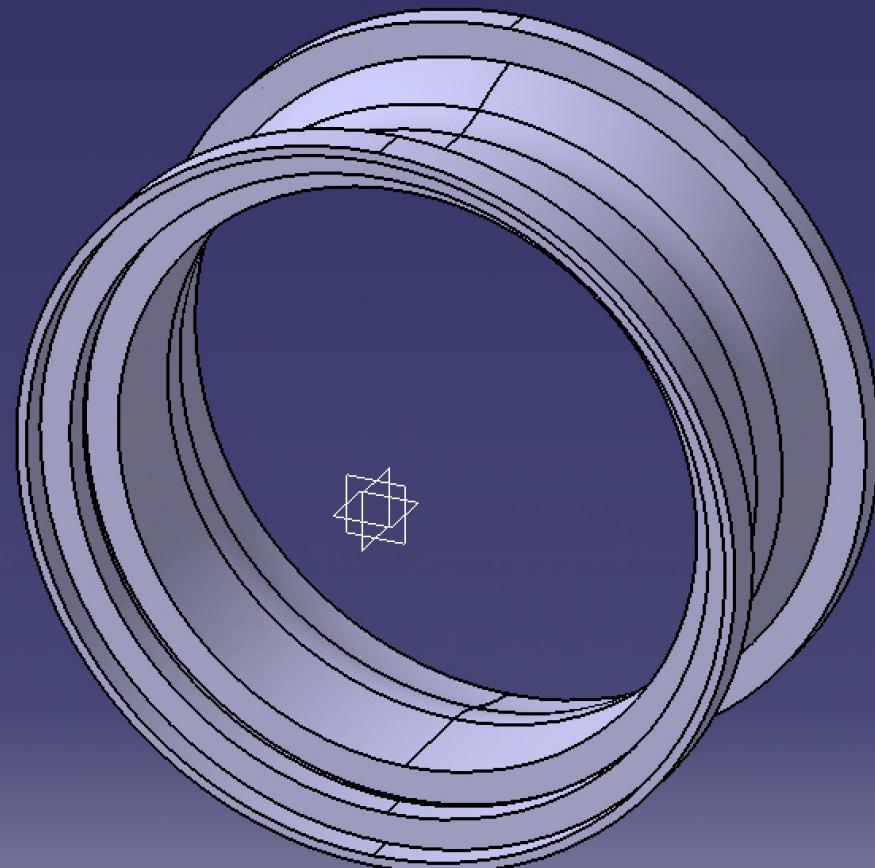
Publication

- U Bracket (Right)
- U Bracket (Left)
- U Bracket Inner (Left)
- Counter Bore Holes Left to Right (Left)
- Countersink Hole Left to Right
- Rounded Flange
- U Bracket Inner (Right)
- Counter Bore Holes Left to Right (Right)
- U Bracket (Back)
- Counter Bore Holes Front to Back (Back)
- Cylinder/Simple Hole Front to Back
- U Bracket (Front)
- Counter Bore Holes Front to Back (Front)
- Countersink Hole Front to Back
- U Bracket (Bottom)
- Rounded Flange (Top)
- U Bracket (Top)
- Cylinder/Simple Hole Top to Bottom
- Counter Bored Hole Locations
- Cylinder/Simple Hole Location

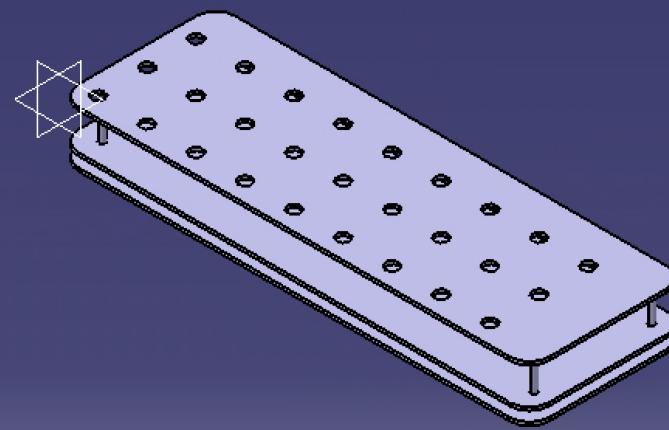


- Make a new part
- Make the planes for the part
- Parameters "On"
- Ensure Part Infrastructure is on
- Product Level
  - NOT PART LEVEL

Part1  
xy plane  
yz plane  
zx plane  
PartBody



212701  
xy plane  
yz plane  
zx plane  
PartBody



- Use McMaster for finding parts
- What are different ways to view a products
- Right Hand rule