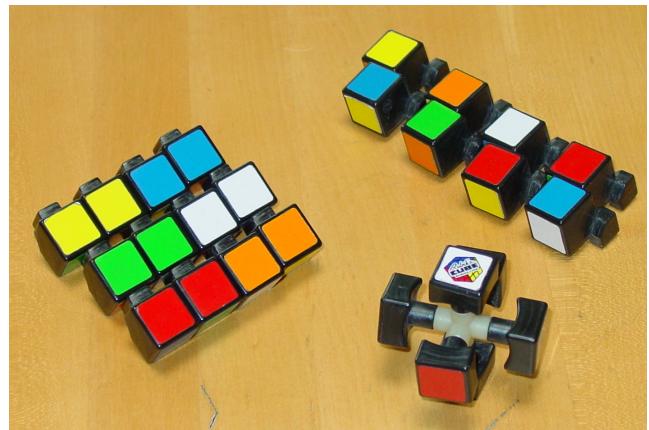
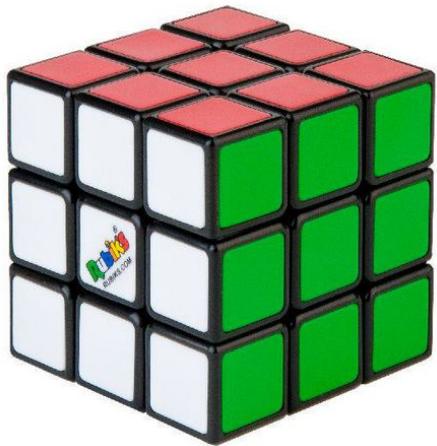


Final Report

Rubik's Cube

Christopher Kruger, Olivia Sohl, Walter Wargacki
E120 - J

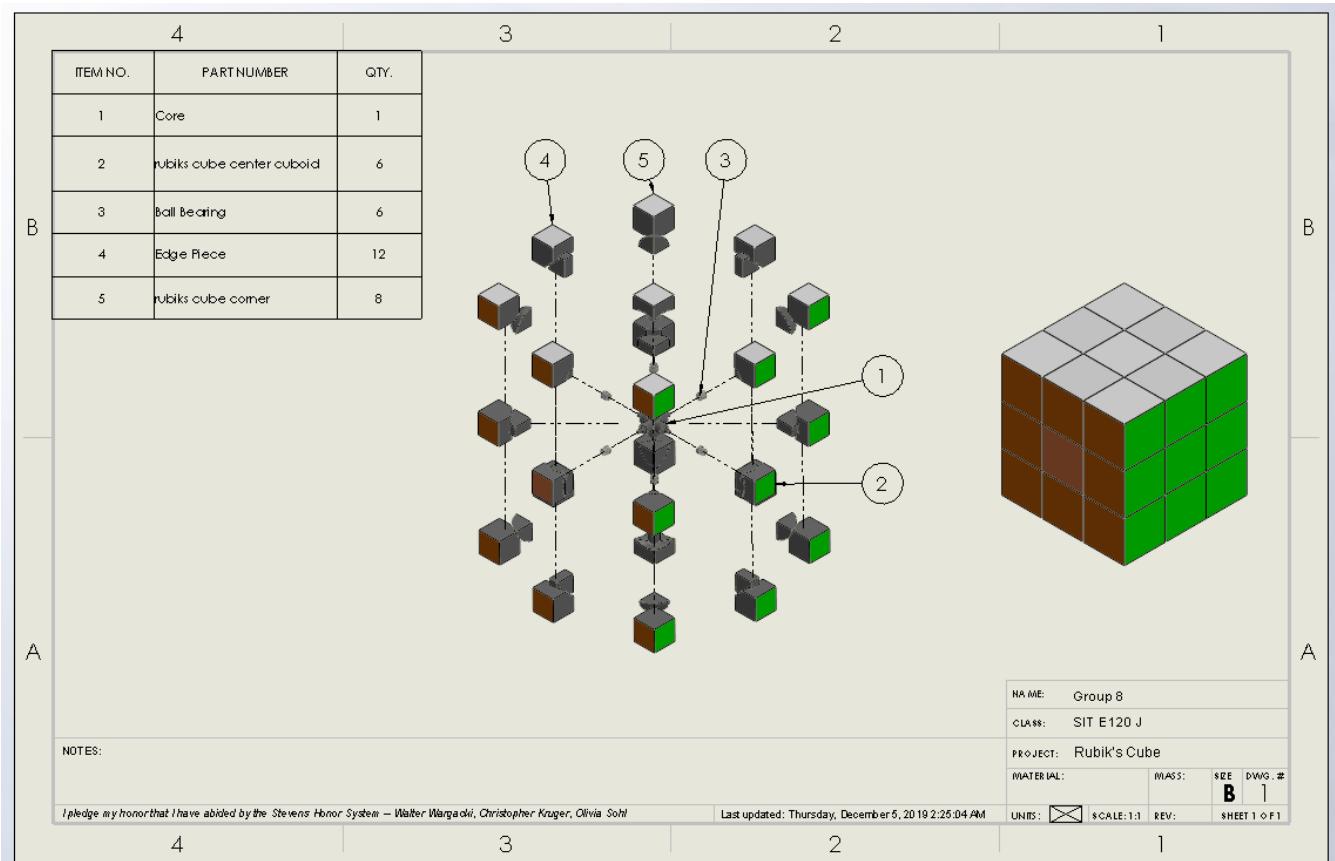


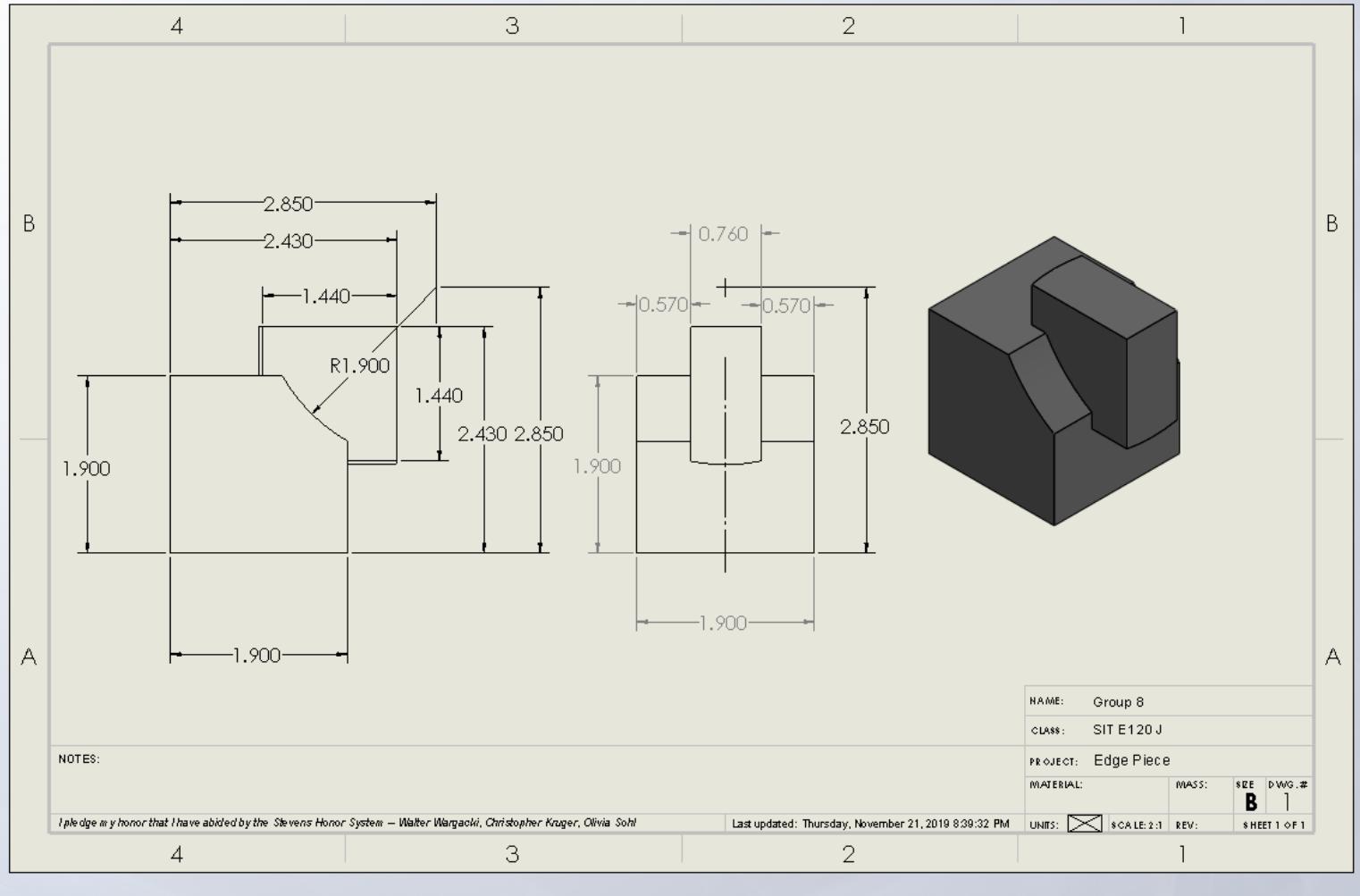
Challenges: The most challenging part of designing this Rubik's cube in SolidWorks was not in the design of the specific pieces, but was actually the process of mating the pieces to allow the Rubik's cube to move properly as a Rubik's cube would in real life. The original process that we did to mate the Rubik's cube was to mate the pieces to each other, but not fully defined so that the pieces were still able to move around each other like a Rubik's cube does in real life. The problem with this was that when we tried to move a row, the cube would basically disassemble and pieces would fly in random directions and the Rubik's cube would fall apart. As we were struggling in mating the Rubik's cube in different ways to see if this would stop happening, we realized that in order to solve this problem the hands of the person needed to be considered in the mating. To use a Rubik's cube your hands hold parts of the cube so that other pieces can revolve around the centerpiece and turn. To allow this to happen in solid works, we realized that we needed to mate the Rubik's cube in rows and unlock, then relock the rows that we wanted to move as we moved them. There needs to be 3 sets horizontal, 3 sets vertical for each panel and then they would be unlocked when the Rubik's is going to turn.

The second part that we struggled with was coloring the surfaces of each side of the Rubik's cube. Originally when we tried to implement color, the whole piece would turn that color and it would not allow us to only color one side. To fix this, we used display states, and now each side can be colored individually.

The most challenging feature to model was actually the ball bearing assembly itself. Since the ball bearing was really really small, it was pretty much impossible to measure accurately. To solve this problem, we measured out dimensions for a bigger ball bearing and then scaled it down in order to fit our measurements.

Rubik's Cube Exploded View

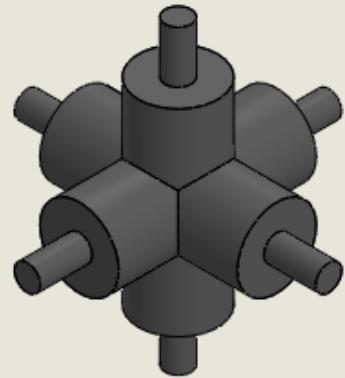
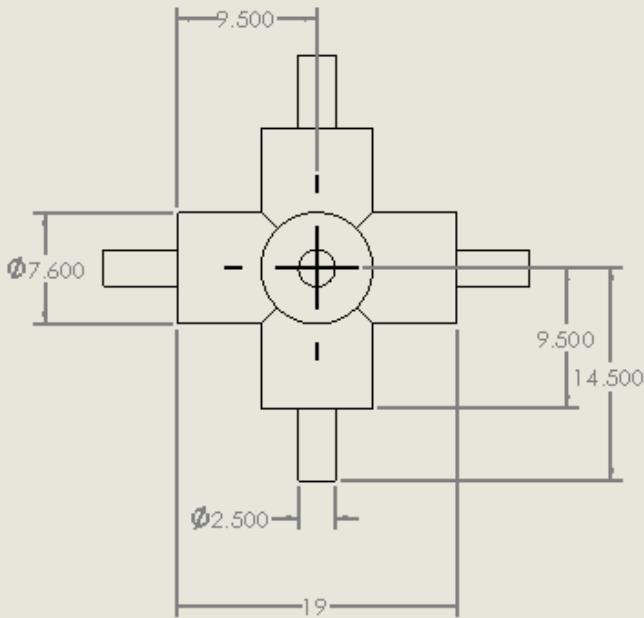




Edge Piece of Rubik's Cube

4 3 2 1

B



A

NOTES:

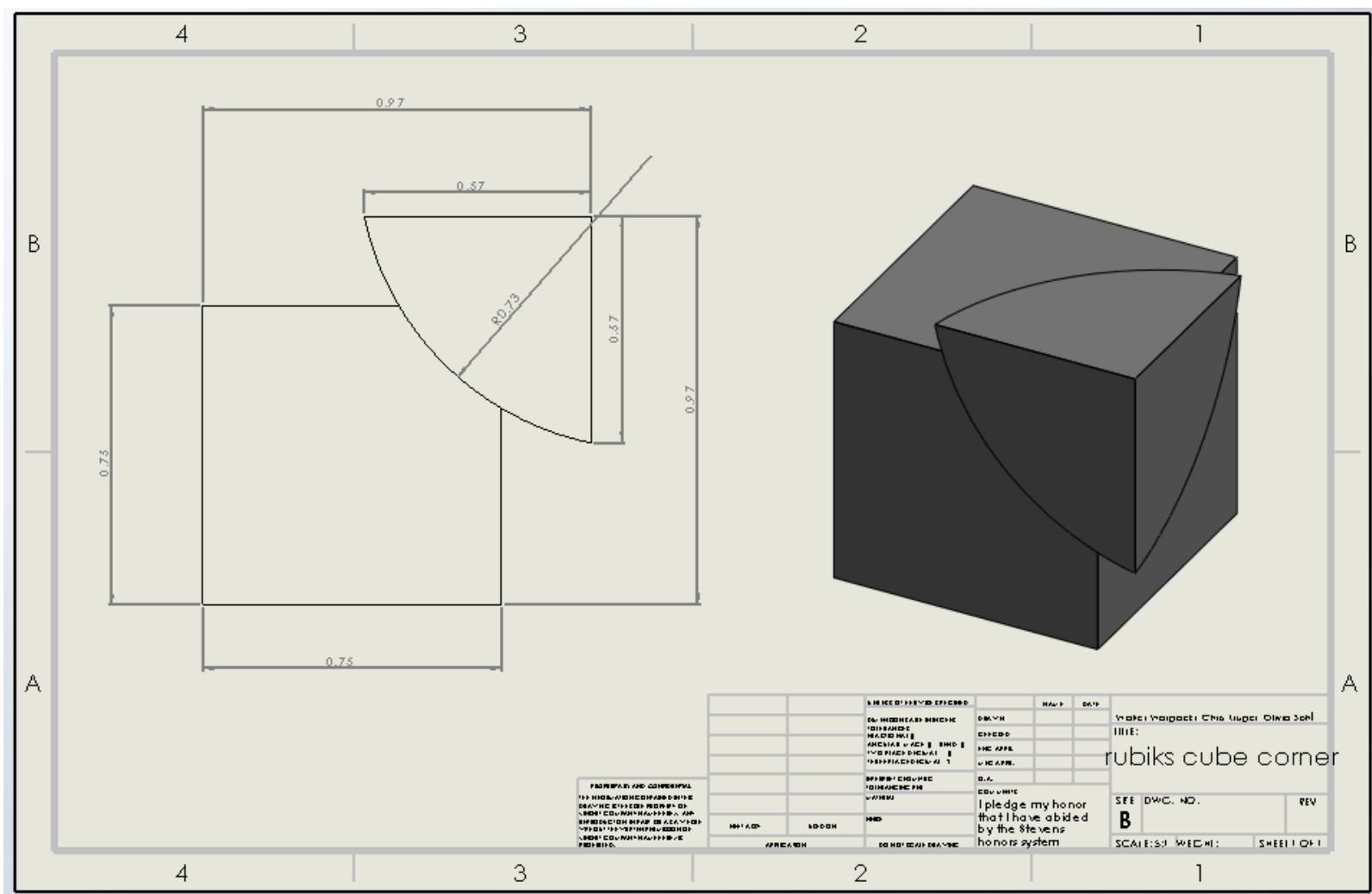
I pledge my honor that I have abided by the Stevens Honor System - Walter Wangard, Christopher Kruger, Oliver Soh

Last updated: Wednesday, November 13, 2019 9:41:18 PM dWHS: SCALE: 2x REV: SHEET OF 1

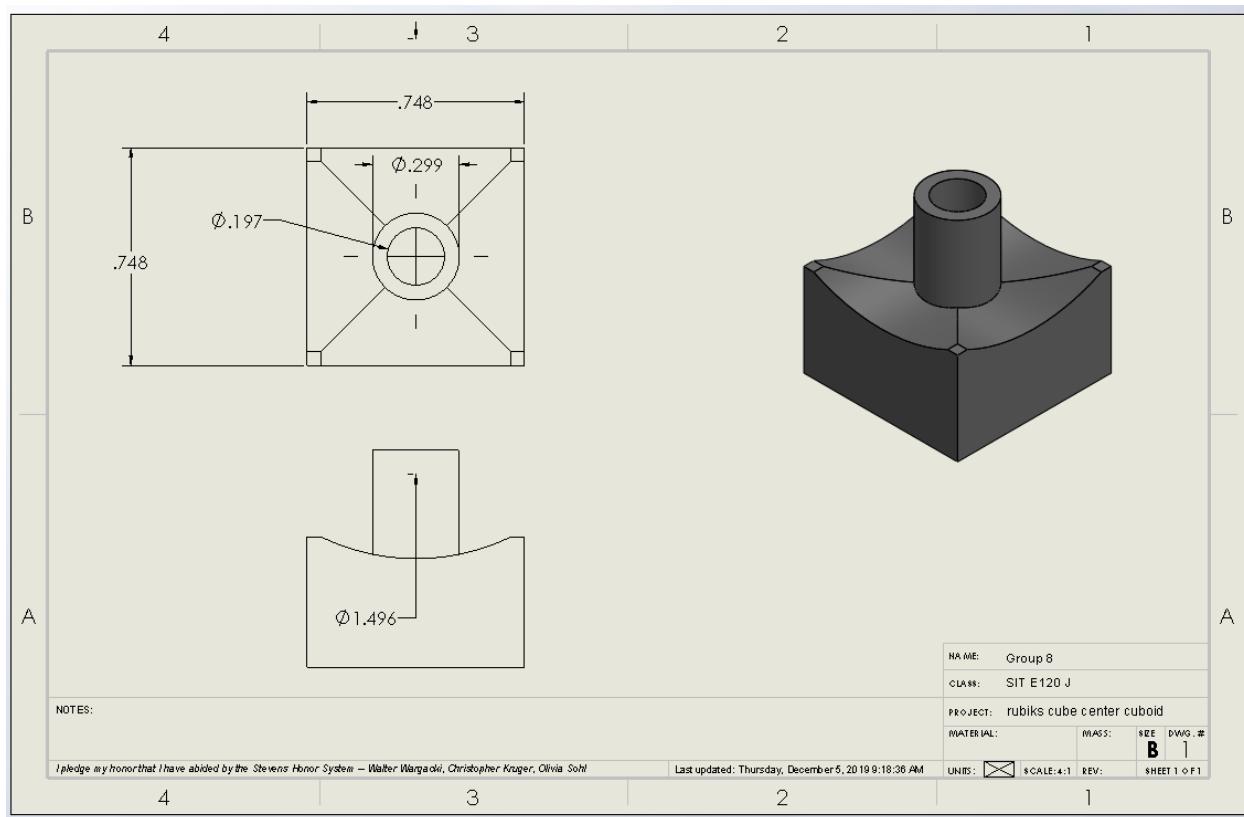
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CLASS:	SIT E120 J
PROJECT:	Core
MATERIAL:	MASS:
	SEE Dwg. F B 1

4 3 2 1

Center Cuboid



Corner Piece

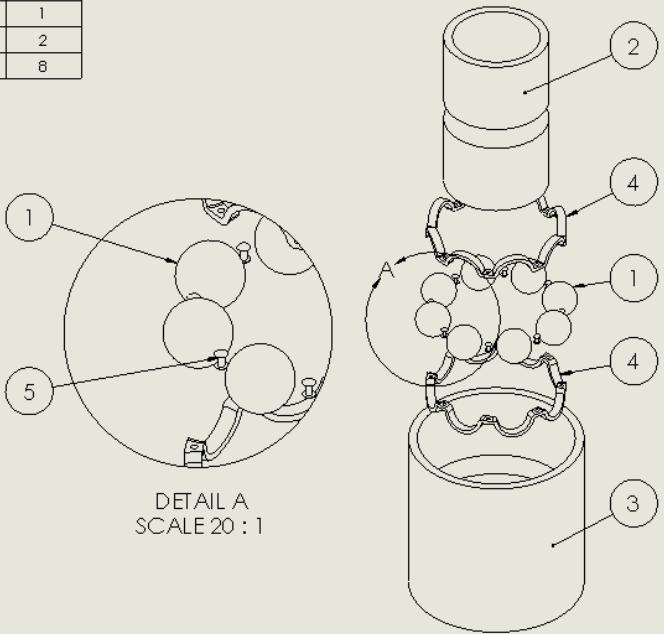


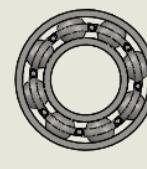
Center Cuboid

Ball Bearing

4	3	2	1
B			B
A			A

ITEM NO.	PART NUMBER	QTY.
1	Ball	8
2	Inner Ring	1
3	Outer Ring	1
4	Retainer	2
5	Small Rivet	8





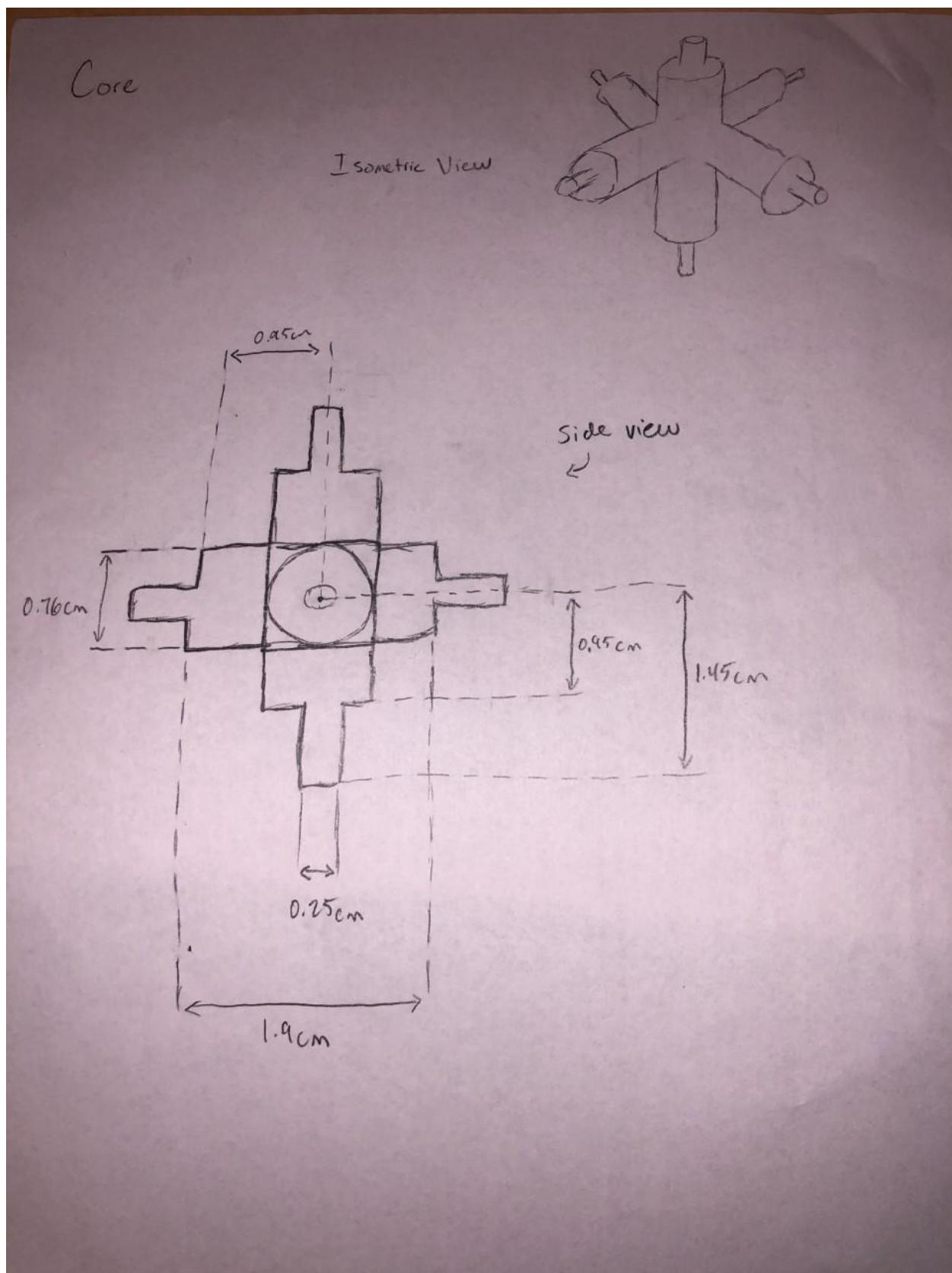
DETAIL A
SCALE 20 : 1

NOTES:

I pledge my honor that I have abided by the Stevens Honor System – Walter Wargacki, Christopher Kruger, Olivia Sohl

NAME: Group 8			
CLASS: SIT E120 J			
PROJECT: Ball Bearing			
MATERIAL: <input checked="" type="checkbox"/>	MASS: <input checked="" type="checkbox"/>	SIZE: <input checked="" type="checkbox"/>	DWG. #: B 1
SHEET 1 OF 1			

Hand Sketches



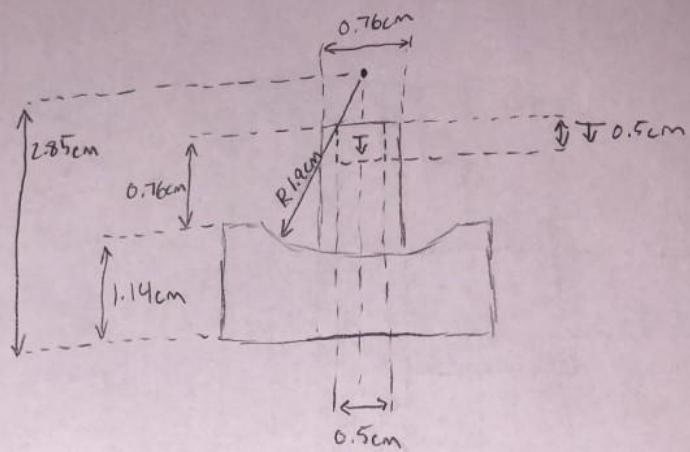
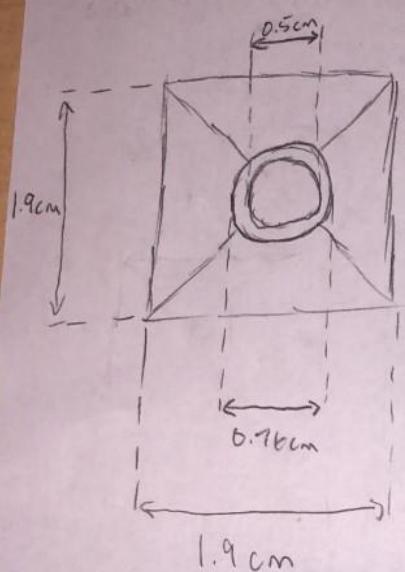
Center Cubelct



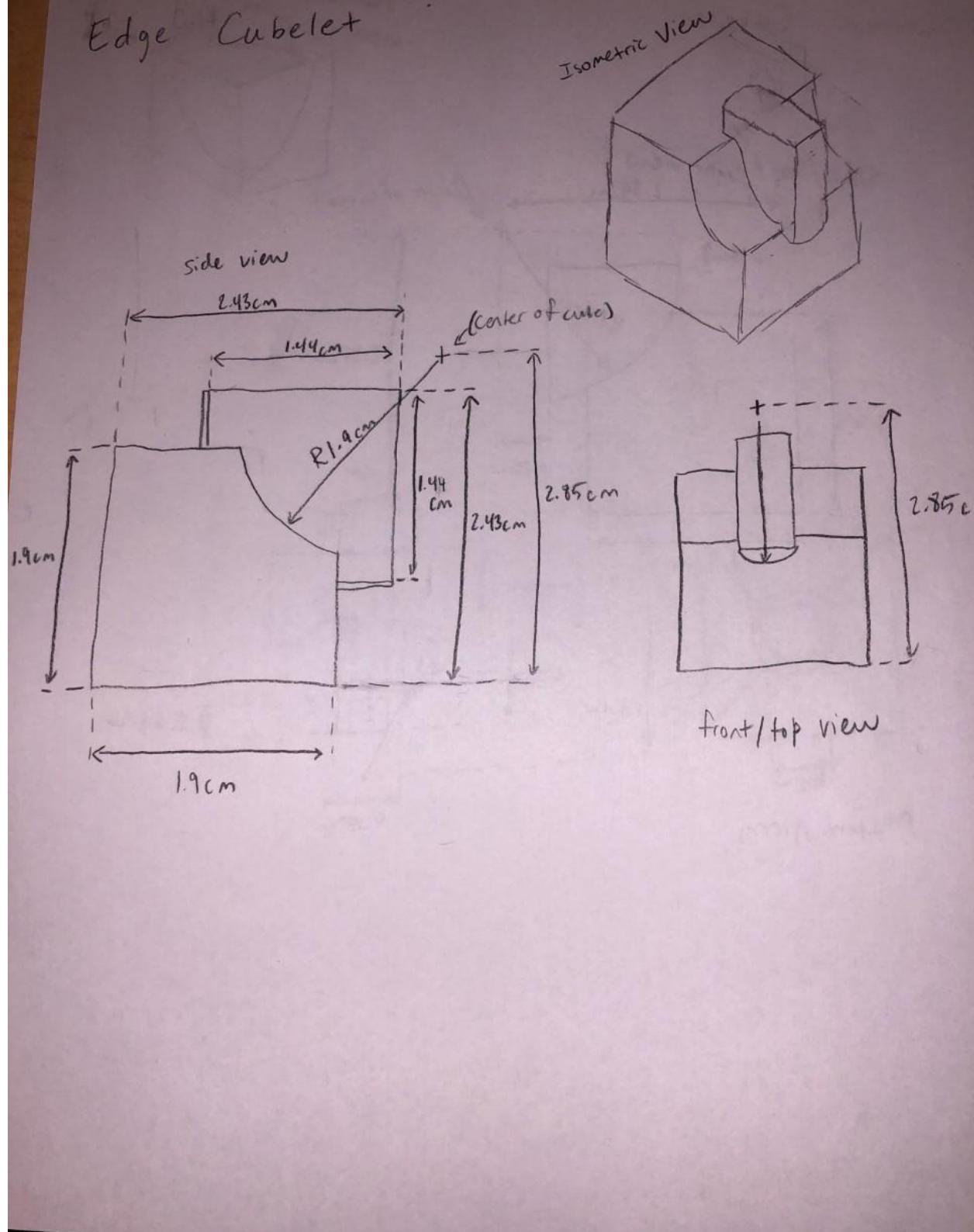
Isometric views



bottom View

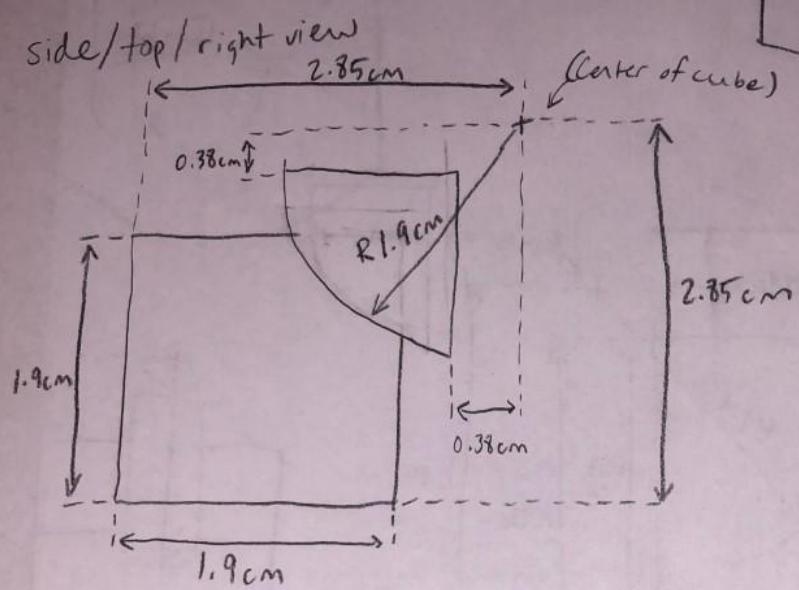


Edge Cubelet

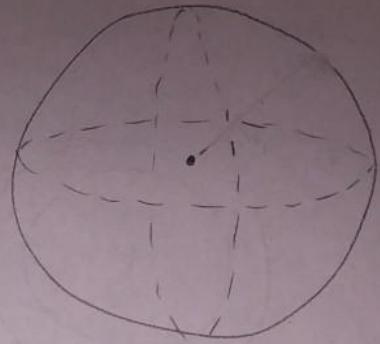
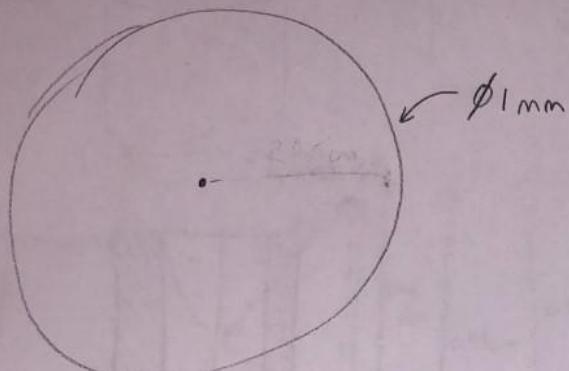


Corner Cubelet

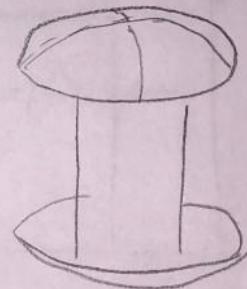
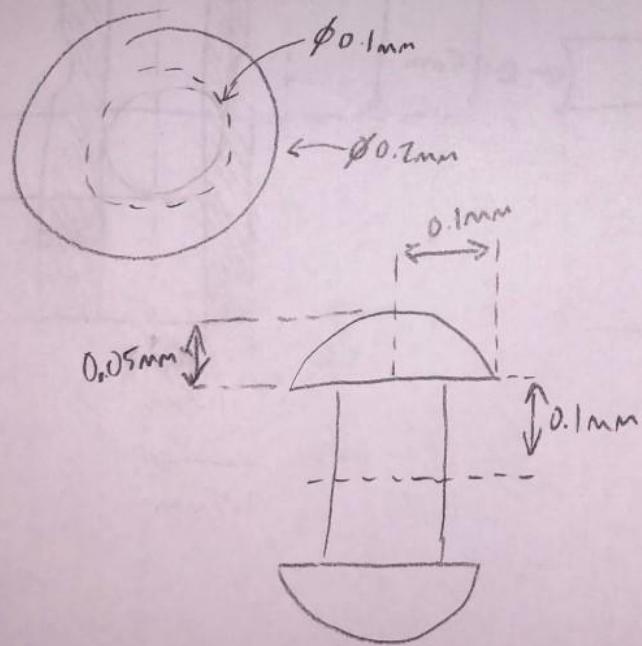
Isometric view



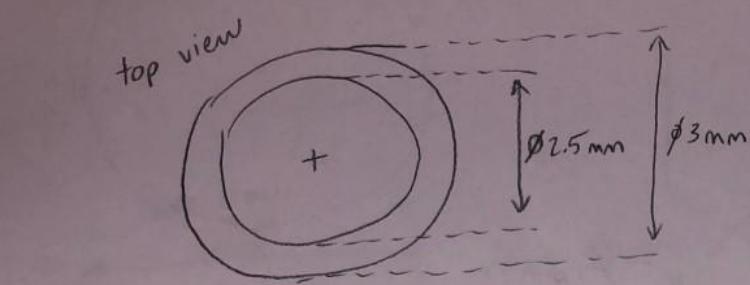
Ball



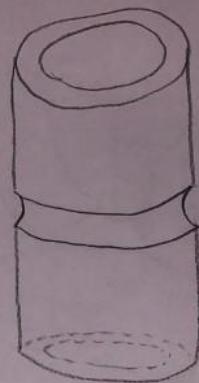
Small Rivet



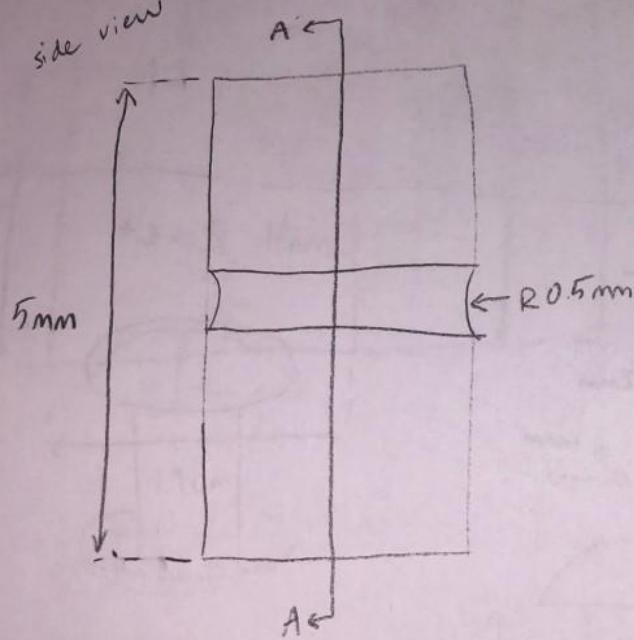
Inner Ring



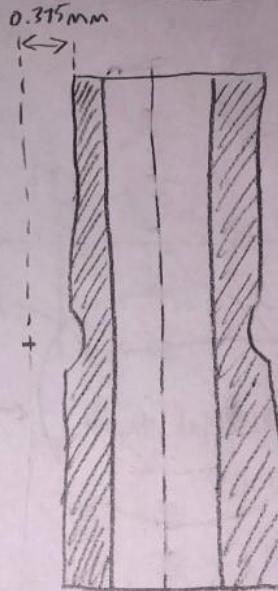
Isometric View



side view

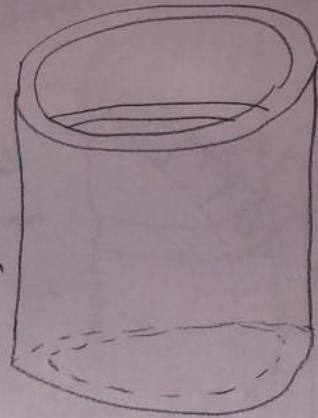
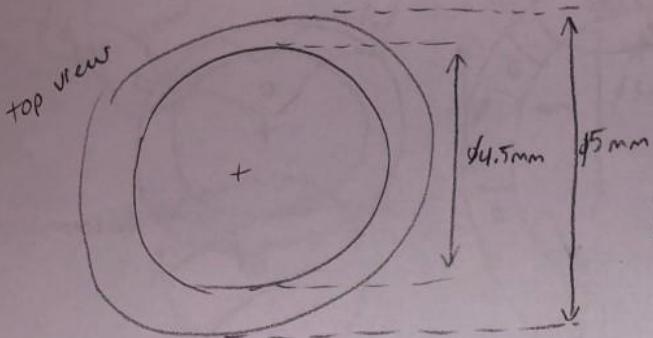


0.375 mm



Outer Ring

TOP view



side view

