

MAE 214 – Fall 2024

Homework #4

Due: Saturday, November 16th, 2024 by 11:59 p.m. via Canvas

Total Problems: 2

Name your files using the following name convention (Remember to submit your files in a .zip file)

HW4_Problem_#_LastName.SLDPRT (Part File)

This homework will be focused on parametric modeling and mass properties.

Problem 1 (50 points):

Using parametric design create a CAD model (in inches) for the part shown below based on the variables “l” and “x”. Submit your part file. All dimensions and features must be fully defined and parameterized for credit.

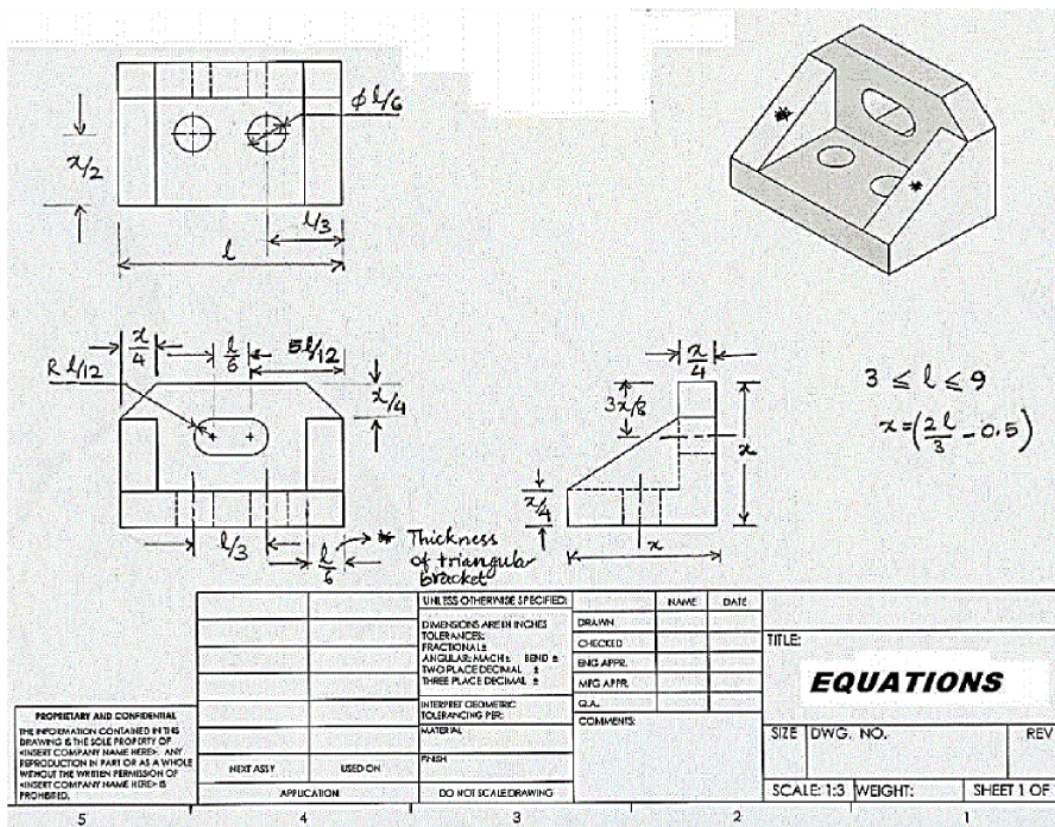


Figure 1

Problem 2 (50 points):

Make a SolidWorks part using the Parametric Modeling approach and assess the part's mass properties. Please refer to the following page for the design parameters (A, B, C) and material properties that you will be applying to your part.

Note that it is important to use the dimensions exactly as provided in the figure such that the parameters (A, B, C) can scale the part appropriately.

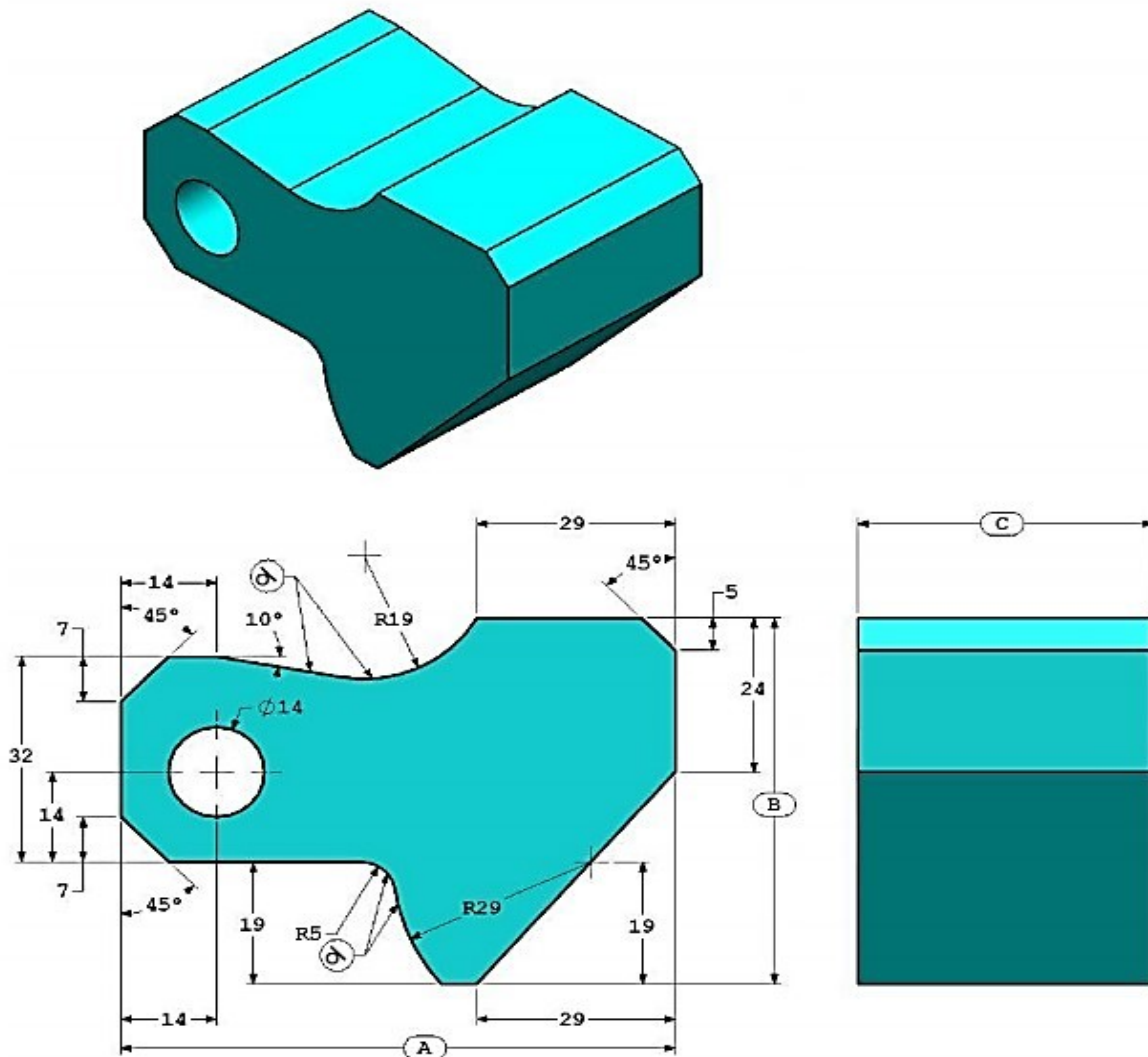


Figure 2

Unit system: MMGS (millimeter, gram, second)

Decimal places: 2

Part origin: Arbitrary

All holes through all unless shown otherwise.

Material: AISI 1020 Steel

Density = 0.0079 g/mm³

A = 81.00

B = 57.00

C = 43.00

What is the overall mass of the part (grams)?

Hint: If you don't find an option within 1% of your answer please re-check your solid model.

a) 1028.33

b) 118.93

c) 577.64

d) 939.54

Grading Rubric

Grading Rubric		0%	
MAE 214 - HW4			
Name:			
Item	Points Available	Points Awarded	Comments
Problem 1 - Parametric Model (50 points)			
Part has correct features with correct dimensions	20		
All model features are correctly associated to the corresponding design variables and necessary equations	20		
Values for the design variables are correct	10		
Problem 2 - Parametric Modeling & Applying Materials (50 points)			
Part has correct parameters with correct values	15		
Part has correct features and with correct dimensions and precision (fully defined sketch)	15		
Part has correct material applied	10		
Part has a mass within 1% of any of the options presented	10		
Total	100	0	